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To Teach Rubber Planting

THE suggestion that America grow the rubber it needs so as to be independent of all foreign control may not as yet have yielded anything tangible but it has at least captivated the imagination of many Americans. They would readily embark upon any such enterprise, if not under the "Stars and Stripes," at least in Mexico or in Central or South America, almost as much for the adventure as for prospective profit. But to buy or lease a plantation on which to raise rubber in the countries named, without advice or experience, would, as many of them realize, be taking a big chance. Soils are so diverse, climate so variable, and labor, marketing, and other conditions so dissimilar that the need is obvious for would-be rubber cultivators of definite, practical, comprehensive instruction in rubber growing and gathering in all its phases.

This need is said to be met in a marked degree by the year-old, well-equipped West Indian College of Tropical Agriculture in Trinidad, British West Indies, which is becoming known as a center of research for not only the British colonies but the tropics generally. Although rubber is not yet produced on a large scale in Trinidad enough is grown there to enable pupils to study the fundamentals of rubber cultivation under capable instructors. The new institution, which is liberally supported by the British Government, by several leading universities of the Empire and by many large users of tropical raw material, is headed by Sir Francis Watts, and its title may soon be changed to the Imperial College of Tropical Agriculture. Thus we have a rubber planting university right at our doors.

Two Hundred Thousand Opportunities

AMERICAN big business will need within seven years fully 200,000 trained young men for leaders in various industries; yet the technical schools of the country have scarcely 50,000 capable of filling the prospective positions. This surprising information was elicited at a recent conference in New York of leading educators and industrialists called by the National Industrial Conference Board, and at which means were considered for dealing with problems of this sort, on the proper solution of which hinges not only the normal growth but also the proper expansion of the nation's productive forces. There it was shown that while the engineering school enrolment for 1920 was 51,908 that for 1923 was but little more, 52,290.

Even disregarding replacements, it is estimated that American manufacturing will require in 1930 fully 400,000 more technically trained persons than were needed in 1920, because of newer working conditions due to corporations being more highly organized, the increase in machinery, power, and other labor-saving devices, as well as the more elaborate forms of control in production and distribution. Thus, while mass production increases the product per worker, it also means a relatively larger increase in the proportion of planners and administrators.

The technical schools are graduating about 9,000 a year; yet of all the men who plan and administer the productive work of the nation fully four-fifths are not college graduates at all, a condition which is obviously wrong. Herein lies the opportunity for an army of young men with technical training and executive ability, and here is a situation which challenges engineering schools to produce quality as well as quantity by requiring that admission shall be based on selective tests, just as they should give students a good grounding in the fundamentals of engi-

neering and the applied sciences as well as specialized training.

A practical way in which the rubber industry can aid the movement as well as strengthen its own position, is by offering ample facilities for training courses in factory work to supplement the college courses; as well as by co-operating with the educators in any other manner that the committee may deem advisable.

Lest We Forget

THE Old Timers Competition of the Tire Division of the Rubber Association of America resulted in a collection of photographs that are of wonderful interest and value. One cannot look over the seventy reproductions shown in the broadcasting through the *Saturday Evening Post* and the Rubber Association posters without being instantly carried back to the days of constant tire troubles. In no other way could the tire user be so generally shown the motoring handicaps of the past, and the almost unbelievable freedom and security of the present.

In scanning the pictures one smiles at the antiquated two and four seaters, the mud, sand, rock and prairie grass roads, at the farmers, clergymen, mechanics, and unclassifiable tourists. Then comes the realization that all are in the throes of wayside tire repair, to be followed by adjustment, replacement, and another limping 500, 1,000 or perhaps 1,500 miles.

That these days are over, that mileage has so increased, that 20,000 miles is no infrequent happening, is a cause for gratification and appreciation of what tire engineers have accomplished. It is, also, of the greatest benefit to tire users that tires are, today, sold on merit and that the name of the manufacturer assures a perfect product. The mileage guarantee was a prolific cause of deceit and of no financial advantage to the buyer. That it was possible to abandon it is the best event in tiredom.

Rubber Bathing Suits—Modest and Immodest

IT is quite natural that woman, in whom is ingrained the desire to be attractive in dress, should rebel against the cloth bathing suit with its ill-fitting parts, balloon-like appearance, clumsy ruffles, plaits, and pantaloons reaching to the feet. It was awkward and unsanitary and soon became water-soaked and sand-logged. In fact, at some beaches where there is undertow it was really the cause of drownings. Then, too, there are the water-absorbing stockings and the canvas shoes that become soft and soggy.

Contrast the light, serviceable, and graceful rubber suit of today's feminine bather. It is all rubber, cap, suit, shoes, and cape. The handicaps of the cloth suit are absent, and there is opportunity for many variations that cloth does not allow of, as, for example, fast colors, and vivid effects unaffected by water.

While Paris is supposed to set the style in dress for the world, it does not happen to be true in rubber bathing suits, as the most artistic creations in caps, suits and shoes first appeared in America. She has, however, taken the lead in extreme suits. So daring were they that the management at Deauville, known to be notoriously indulgent and liberal, apparently found a just cause to object.

The particular type of suit that was censored was made of either transparent, semi-transparent or flesh-colored rubber with no fabric under or over it. It clung so closely to the wearer's form that every curve was accentuated. Indeed, the flesh-tinted rubber gave the impression of nakedness that was, to say the least, startling. A few such suits have appeared at American beaches but are very decidedly criticized by some officials and forbidden by others. It is, however, a pity that it came into being at all, because the best bathing suits made today are those of rubber and fabric and are known as rubber suits, as were the immodest ones.

OUTSIDE THE TRADE, PROBABLY BUT FEW HAVE KNOWN that ordinary steel and japanned buckles used on arctics and rubber boots and shoes have borne a federal interest-bearing tax as "jewelry," although such articles are manifestly as essential as laces or buttons for footgear fasteners. Now the absurd charge and classification have been abolished by the Internal Revenue Bureau following an appeal made by the Massachusetts Retail Merchants' Association. It is a relief to find that government officials can now distinguish between necessities and luxuries, and that they no longer penalize people for dwelling where snow and slush abound.

SO RAPID HAS BEEN THE RISE OF RADIO COMMUNICATION that even those who might be expected to know better have been freely predicting that the day is not distant when broadcasting will quite supersede ocean cabling. Signor Guglielmo Marconi is one of the savants quoted as saying that the early elimination of submarine telegraphy is inevitable; yet an authority of at least equal rank, Newcomb Carlton, president of the Western Union Telegraph Company, declares that, while wireless is developing a volume of new business and probably will continue as a valuable adjunct of the cables, it cannot be regarded as really a rival. Its New York-London word rate is 18 cents compared with the cable rate of 25 cents, but a cable is now being constructed for the Western Union that will transmit eight to ten times the volume of words now permitted by the ordinary cable. Hence a considerable price cut is highly probable. Moreover, the secrecy of the cable and its freedom from atmospheric electrical troubles make a peculiarly strong appeal to the business world. It will not be scrapped for a while.

". . . . . THIS WE COMMANDED YOU, THAT IF ANY would not work, neither should he eat." 2 Thess. 3:10.

Present Status of the Low Pressure Tire

Its Development and Characteristics—Advantages and Disadvantages—Sizes in Use—The Need of Standardization

RIDING on air, which until very recently has been merely a figure of speech to describe the smoothest motion imaginable, has at last become a reality through the development of the low pressure or so-called "balloon" tires, also referred to occasionally as air cushion, doughnut, supersize and super-pneumatic. At first regarded merely as freaks, they are now recognized as an epoch-making advance in tire design which promises to revolutionize the entire motoring world.

United States

The keen public interest being manifested in them is justified by the fact that twenty-one companies, including practically all the leaders in the trade, are now making them either experimentally or for the trade. Furthermore, several automobile manufacturers have adopted low pressure tires as regular equipment on their sport models, and other manufacturers list them as optional equipment.

That the development of low pressure tires is not yet complete seems likely. Further experience will probably bring improvements, modifications, and standardization, but that they are here to stay for a thorough trial can hardly be questioned. Everything points to wide use as soon as standard sizes are agreed upon and manufacturing facilities can be altered to produce suitable tires, tubes, rims and wheels.

Genesis of the New Development

Briefly described, low pressure tires are about twice as big in air space as ordinary oversize cords and are inflated to only about half the ordinary pressure for a given load. Fundamentally there is nothing new in the idea of increasing tire size and reducing air pressure to obtain easier riding. These were characteristics of the "aerial wheels" of Robert William Thompson, the first patentee of a pneumatic tire in 1845, and which were so ridiculed because of their five-inch diameter for a brougham. Other pioneers in tire design held his views but lacked the means to make them practicable. Now tire engineers are returning to this principle, but with the experience and developments of three-quarters of a century to assist them.

That the demand for low pressure tires has existed for a long time is indicated by the common practice of car owners to disregard tire mileage costs and deliberately under-inflate their tires for the sake of comfort. Tire company adjustment records show this to be one of the most flagrant forms of tire abuse. As an extensive educational campaign has failed to check this abuse it is evident that the public intends to ride on low pressure air, and the problem of tire manufacturers has been to produce a true low pressure tire which they can guarantee.

Emerging from the Experimental Stage

Difference of opinion still reigns regarding the practicability of low pressure tires as now being made, and this is as true of tire and automobile engineers as of the general public. Their attitude ranges all the way from actual and enthusiastic adoption by certain companies to direct opposition, with all shades of opinion between these extremes.

Tire engineers are fairly well agreed that with modern methods of cord construction it is now possible to secure an improved cushioning effect by resorting to larger sizes and lower pressures. Instead of jumping at conclusions and rushing to extremes, however, most of them would have preferred to complete their investigations to ascertain the limits of safety and economy before putting new sizes on the market. The current hasty development is due to keen competition under the urge of public interest.

While few are asserting that the sizes offered are too large or likely to be too short-lived to give consumer satisfaction, few are bold enough to claim that low pressure tires have passed the experimental stage, especially in respect to sizes. Practically all of the twenty-one manufacturers engaged in this new development are supplying tires to automobile manufacturers for experimental purposes and preparing for a possible active demand. Firestone, Goodrich, Miller, and Michelin are perhaps the most active in this new field, and their dealers are beginning to stock the new tires.

Distinguishing Features

The low pressure tire, as now manufactured, is wholly predicated on modern cord construction and represents a further advance of the oversize tire idea. It is being developed for passenger cars only, not for trucks or buses. Its greatest advantage is the ease of riding, which is the result of carrying very little air pressure in a large section tire with a smaller number of cord plies. A four-ply, instead of the usual six-ply cord carcass permits extreme flexibility of the side walls without generating undue heat due to internal friction. By doubling the volume of the air cushion and the area of the road contact it has been found possible, owing to the flexibility of cord construction, to cut the inflation pressure in half. Maximum pliancy, resiliency and air cushioning effect is thus secured and the shocks of the road are absorbed by the tire without transmission to the chassis and body of the car.

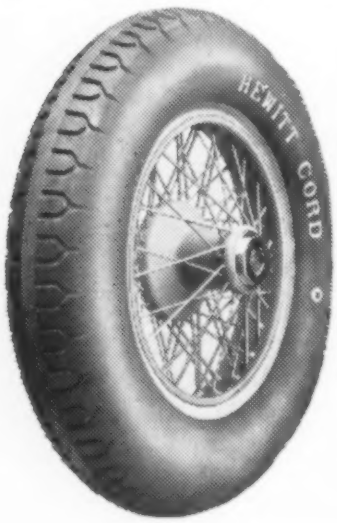
Firestone

Advantages of Low Pressure Tires

Numerous and important advantages are claimed for low pressure tires, all of which may be classified under three general heads, viz.: easier riding, better traction, and greater durability.

Easier Riding

Cushioned on twice the air space of the ordinary oversize cord at only about half the usual air pressure, the ease of riding on these new tires is remarkable. Rough streets become like boulevards; holes and ruts are seen but not felt; roads known to be bad seem perfect. Riding comfort and driving pleasure are greatly enhanced.



Hewitt

This easier riding benefits the car as well as the passenger. Low pressure tires materially reduce car depreciation and upkeep costs by minimizing the amount of vibration. They prevent countless chassis strains, loosened nuts, closed body rattles, and provide great protection from ordinary wear and tear. A car equipped with these tires may reasonably be expected to last from 50 to 100 per cent longer at a consequent saving of hundreds of dollars annually.

Owing to double the usual area of ground contact, due to the flattening of the tire at about half the ordinary inflation, much better traction is secured. Moreover, low pressure tires are of such flexible construction that they seldom lose contact with the ground. The double traction area is therefore made practically continuous and far greater safety results.

A car equipped with low pressure tires holds to the road better and does not sink so readily into mud or sand. Skidding is practically eliminated. Braking is much quicker and more certain. The effective power and speed of the car are considerably increased. More effective power is said to be due to the fact that low pressure tires absorb less energy than ordinary tires.

Greater Durability

The greater durability claimed for low pressure tires is due to their better traction and greater traction area. Because road wear is divided over a much larger tread surface in contact with the road, the tread is said to last longer than that of ordinary cord tires. There is also practically no wear due to skidding, or to spinning of the tires in starting or sliding while braking.

The tendency to puncture, it is claimed, is reduced because the small weight supported by each square inch of tire makes it possible to ride safely over sharp objects that would injure ordinary tires. Being soft, because of the low air pressure, the tire does not "fight the road," but simply folds itself over, absorbs or "drinks" ordinary obstructions. The same is true to a considerable degree as regards sidewall wear against curbstones and in deep ruts. Generally speaking, therefore, it is asserted that low pressure tires assure better road performance, last longer, and are more economical than ordinary tires.

Disadvantages of Low Pressure Tires

Experience, however, is showing that low pressure tires have certain disadvantages, which may be classified under three heads, namely: operating disadvantages, engineering difficulties, and economic objections.

Operating Disadvantages

Low pressure tires, flattening as they do, make steering a little harder than ordinary tires, but steering gear changes are readily made to offset this. Any difficulty in turning the wheel when parking in crowded quarters is more than offset by the fact that the tire can mount the curb without injury. In ordinary driving the car steers well but has a tendency to lean toward one side or another. A more satisfactory ratio on the steering mechanism appears to be necessary, corresponding to the kind of tire used and the load it supports.

While low pressure tires absorb pavement and ordinary road irregularities, holes and humps beyond the general road level produce excessive rebound. This may be readily controlled by shock absorbers, snubbers, or rebound checks now common on many cars.

The fear has been expressed that blowouts of low pressure tires, especially on front wheels and at high speed, might result in serious accident. Experience shows that at any speed no danger need be feared beyond the tendency of any flat tire to draw the car to its side of the road.

Front wheel shimmy has been encountered when equipping some existing cars with low pressure tires. It rarely occurs except at very high speeds, and taking up the looseness in the steering gear linkage stops it. Tire engineers and others assert that this tendency is exaggerated by the narrow rims being advocated, as the tire balloons over the rim to a greater extent and steering is rendered more difficult due to side rolling. They claim that with 20-inch wheels instead of 23, 24 and 25-inch wheels, as for ordinary tires, and a rim of ample width for stability yet somewhat lighter in section, weight can be saved. Nominal sizes similar to those used with high pressure tires are advocated.

Engineering Difficulties

While it is quite possible on some cars to substitute low pressure for ordinary tires easily and with complete satisfaction, on others various changes are necessary. Some engineers assert that the full benefit to be derived from low pressure tires cannot be realized by applying them to an old chassis with standard springs and steering gear, both of which should be modified to benefit from the lower rate of vibration. Clearance is another important matter requiring several modifications in some instances. These are confined chiefly to fender changes, details of brake and axle design to provide additional offset.

Goodyear

None of the engineering difficulties are insuperable, however, nor the monetary considerations excessive, and once car makers learn what balloon tires will do for a car, it is believed they will be able to design lighter cars and thereby save money. These engineering difficulties were reviewed in detail by J. E. Hale, the Firestone development engineer, before the Indiana meeting of the Society of Automotive Engineers, as follows:

When the manufacturer fits low pressure tires to new vehicles or attempts change-over work on existing cars, there are only two questions: First, how much to offset the rear wheels to clear the brake rigging so that the sidewall of the tire and flange of the rim will clear; and, second, how to provide means for carrying the spare tire. In cases where the rear wheels do not have to be offset and the brake drums are not too large in diameter, the wood wheels can be rebuilt, using a steel felloe wheel and demountable rim especially designed for these tires. These demountable rims

are of the endless type, having a spring side ring. Where wood wheels cannot be used because they cannot be offset sufficiently, either wire or disk wheels have to be resorted to, and for these cases the same type of rim has been perfected, but, of course, worked out in such a manner as to be built into the disk or wire wheel, as the case may be.

In fitting tires of the 4.40 and 5.25 size to cars in their respective classes, it is a pretty straightforward proposition, the fender clearances and brake drum clearances being naturally sufficient to accommodate the tire change without any complications, and in consequence of this situation the manufacturers of cars in these classes can adopt the balloon tire with little or no change in the chassis so far as these clearances are concerned.

In applying the 6.20 balloon tire to substitute for the 4½-inch on cars of 118 or 126-inch wheelbase, the rear wheels in most cases have to be offset, varying in amount from ½ to 3¼ inches in order that the sidewall of the tire or flange of the rim will properly clear the brake lever arm. In practically all cases the fenders are wide enough to cover the tires properly against mud-throwing.

The 7.30 tires substitute for the 33 by 5 and are practically identical in standing diameter, so that the fender clearance is satisfactory. However, the brake diameters of these large cars are sufficiently great so that brake mechanism interference calls for greater offset of the tire for proper clearance (¾ inch or more), so that, combined with the tire section, the sidewall of the tire in some cases is rather near the fender line, which, of course, would account for mud slinging. Manufacturers naturally are reluctant to narrow the wheel housing as it cuts into the seat space, and as a result the resistance on this point is rather difficult to handle unless they are willing to increase the tread of their rear wheels to cover the deficiency. In some cases it has been reported that the turning radius of the steering wheels has been reduced slightly with this size.

Sizes and Makes of Low Pressure Tires

Eight different sizes are more or less common to the lists of most of the companies now producing low pressure tires. The 29 by 4½ size, which is used on taxicabs, predominates. The following table gives the sizes and the firms manufacturing them:

28 by 4	30 by 5	34 by 7
Goodrich	Goodrich	Armstrong
Hewitt	Goodyear	Brunswick
Miller	Hewitt	Firestone
	Horseshoe	Fisk
29 by 4½	Michelin	General
Ajax	Miller	Goodrich
Brunswick	Pennsylvania	Goodyear
Corduroy	Superior	Miller
Empire	United States	Mohawk
Firestone	Vitalic	
Fisk		36 by 8
General		Armstrong
Goodyear	32 by 6	Firestone
Hewitt	Armstrong	Fisk
Horseshoe	Brunswick	General
Michelin	Firestone	Goodrich
Miller	Fisk	Goodyear
Pennsylvania	General	Miller
Racine	Goodrich	
United States	Goodyear	38 by 9
	Hewitt	Goodyear
30 by 5	India	Miller
Firestone	Miller	
Fisk	Pennsylvania	40 by 10
General	Superior	Goodyear

To the above may be added five special Michelin sizes intended to fit existing straight-side standard rims without any change in rim equipment:

Michelin Comfort Cord Sizes	To Replace Ordinary Cord Sizes
33 by 5.70 inches	31 by 4 or 32 by 4½ inches
34 by 5.70 inches	32 by 4 or 33 by 4½ inches
35 by 5.70 inches	33 by 4 or 34 by 4½ inches
35 by 6.60 inches	32 by 4½ or 33 by 5 inches
37 by 6.60 inches	34 by 4½ or 35 by 5 inches

Firestone engineers believe that the four sizes indicated in the following table will serve to equip such cars as are now being produced at inflation pressures of 20 to 35 pounds per square inch:

Low Pressure Tire Section Size, Inches	High Pressure Tire Equivalent Size, Inches	Maximum Load Per Wheel Pounds	Wheelbase Range for Each Tire Size Length, Inches
4.40	3½	750	100 to 103
5.25	4	1,000	108 to 115
6.20	4½	1,300	118 to 126
7.30	5	1,700	130 to 140

Inflation

Low pressure tires are constructed to carry an air pressure of 20 to 35 pounds per square inch, depending on the size of the tire and the weight of its supports. This radical reduction from previous standards is made possible by the larger tread area which rests on the ground.

For example, if the load to be supported by the tire is 1,000 pounds, and the number of square inches of the tire tread that may touch the ground at one time is 25, then each square inch must support one-twenty-fifth of 1,000 or 40 pounds; and the tire must be inflated to a pressure of 40 pounds per square inch. But if the number of square inches resting on the ground can be increased to 50, each square inch need support only one-fiftieth of the weight, or 20 pounds, and the tire need be inflated only to that pressure.

Rims for Low Pressure Tires

Most of the low pressure tires on the market are designed to fit the new 20-inch base diameter rim instead of the 23 and 24-inch rims most commonly used for ordinary tires. Several passenger car size ordinary cord tires employ a 20-inch rim of ordinary construction, and some sizes of heavy duty truck cord tires also. For example, the 32 by 6 tire fits a 20-inch rim.

An easy way to determine rim diameter is to subtract twice the cross-section size from the height of the tire. In the 32 by 6, for example, the cross-section size is 6 inches. Twice that is 12 inches. Subtract that from 32 and the result is 20 inches—the rim diameter.

The Need of Standardization

As mostly used, low pressure tires are of divers sizes and not standardized as to rim requirements. Indicative, however, of the apparent belief of tire manufacturers in the permanence of this type of tire is the fact that the importance of standardization is already being given some attention. Discussions are under way between tire and automobile engineers. It is realized that the introduction of low pressure tires on new cars will probably be followed by a demand for the same or similar sizes on cars already in use. Tire manufacturers fear that if it is left to the car maker to specify the sizes to be used on his product, there soon may be calls for many different sizes and curious combinations of new tire sizes and old style rims that would work general confusion and hardship on the dealer. They realize the wisdom of confining production to a few sizes interchangeable on standardized rims.

Standardization Proposals

Firestone engineers favor a narrow 20-inch rim, while Goodyear engineers prefer a wider 22-inch rim, said to be demanded by large customers. A 21-inch compromise rim has been proposed which, however, is unacceptable to many car makers. Failing an agreement among car makers it is feared that tire, rim, and wheel manufacturers may be called upon to make a variety of sizes with heavy tooling costs.

Other companies may follow the Michelin lead and bring out a line of low pressure tires interchangeable on present standard rims. It is pointed out, for example, that substituting a 35 by 5 low pressure tire for an ordinary cord of the same nominal size, instead of for 33 by 4 or 34 by 4½ as intended, and running it at the reduced pressure would cause rapid destruction of the overloaded tire.

Meanwhile Colin Macbeth, engineer of the Dunlop Rubber Co., Limited, London, England, has offered detailed proposals for international low pressure tire and rim standards deserving of thorough consideration.

Proposed Balloon Tire Standards

The Executive Committee of the Rubber Association of America has recommended the following "Balloon" tire standards:

Rim Inches	Tire Size Inches	Cross-Section Inches
21	29 x 4	4:40
21	31 x 5	5:25
21	33 x 6	6:20
20	32 x 6	6:20
20	34 x 7	7:30

The rim widths recommended are those in present use on 3½, 4, 4½ and 5-inch tires.

Controlling Wastes in the Tire Plant

Material Spoilage—Uncured Friction Waste—Gum Stock Spoilage—Cured Rubber Waste—The Psychological Aspect

By K. C. C. R.

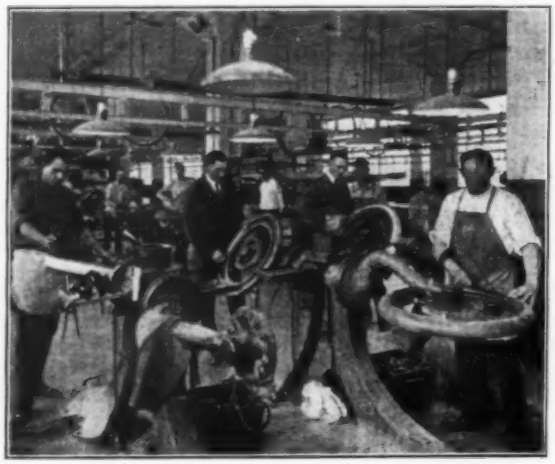
PROFITS in tire manufacturing at the present time are entirely contingent on ultra-efficiency in the plant; in other words, costs must be cut to the last dime without impairing quality. This drive for economy had its inception in 1920-21, and one of the first items which called for immediate attention was plant spoilage. An idea of what has been accomplished in cutting down waste can be gained from the fact that whole installations of machinery and equipment have been thrown out and replaced by more efficient units simply on account of their excessive spoilage of material.

Material wastes, about which this article is concerned as distinguished from wasted labor, power, or space, are more concentrated in the tire plant than in other branches of the industry; in other words, they occur in only a very few processes, and for that reason have been long neglected.

Briefly, the spoilage occurs in three or four groups of materials, namely: (A) fabrics; (B) fabric and gum combined; (C) gum, uncured and cured.

Fabric Waste

Waste of fabrics rarely occurs on those kinds of cotton goods which go directly into the tire before the actual coating with rubber. Occasionally a wrong method of piling cord fabric in stores will cause the breaking of filling threads and render it unfit for use. Cord fabric should always be piled flat with the rolls running in the same direction, never criss-crossed, as the weight of the rolls will in time cause broken fillings in the rolls at the bottom of the pile. Many large tire manufacturers found this out by bitter experience when they began to use up the last ends of their war-time inventories. Salvage value of remnants of cord fabric unfit for calendering is about 10 cents a pound.



Trimming Tire Casings

The large item in cloth waste is in discarded liners which accumulate regularly. The remnants may be cut up and used for book leaves, and the smaller pieces, when free from rubber, have a salable value from 1 to 3 cents a pound for old rags. Unquestionably the use of treated liners, of which there are several types on the market, while calling for greater initial expense, will prove as cheap in the long run and eliminate the misappropriation of cloth by workmen for towels, aprons, etc.,—a practice never wholly eradicated in any factory.

Standardization of liners is the best method of reducing waste of cloth and retarding their depreciation. This is accomplished by determining the proper length of roll for each class of stock which requires a liner. This takes into consideration storage conditions, weighing facilities, ease of handling, probable consumption of the kind of stock, and the best lengths for the subsequent operation. Then the liners are hemmed at the ends, marked with the length, weight, and purpose for which they are to be used, and cutting or splitting of the rolls is forbidden under penalty of dismissal. This does away with the wasteful practice of sewing ends of liners together until in a very short time the liners are all seams and worthless.

Some concerns have carried this standardization a step further and adopted a color scheme for liners, so that workmen who cannot read can be taught that a black liner is for tread stocks, a blue one for tubes, a yellow one for friction, etc. This scheme only calls for the added expense of dyeing, which improves the liner by eliminating the cotton nap, and the cost is well repaid by the prolonged life of the liner. Liner expense is often overlooked by careless cost accounting which charges it in with raw material, but it can easily run into several thousand dollars a year even in a small plant.

Tube wrapping tape is another large fabric waste, impossible to eliminate and hard to control. This cloth is continually exposed to live steam and water which rot the cotton rapidly so that the tape breaks under tension and has to be discarded. Sewing the short ends together again prolongs its life to some extent. When dried the waste pieces are readily salable for use in making paper and rag rugs, at 5 to 8 cents a pound. Some rubber companies have found that treating the tape with chemicals delays the action of the water somewhat. The only way that manufacturers have gotten away from using tube tape is by tubing the tubes instead of laminating.

Uncured Friction Waste

Waste of fabric combined with gum is the biggest scrap item on the tire cost sheet. All tire plants have from ten to a dozen kinds of fabrics which pass through the calenders several times for coating and frictioning. Generally speaking, they include cord fabric, 2½ pick 15.1 ounce, 15 ply; 17¼ ounce builder, 23 ply square woven; leno breaker strip 8 or 10 ounce; 8¼ ounce chafer square woven; sheetings and osnaburgs for flaps and bead wrappings, 8 to 10 ounce ducks for tube patches, etc.

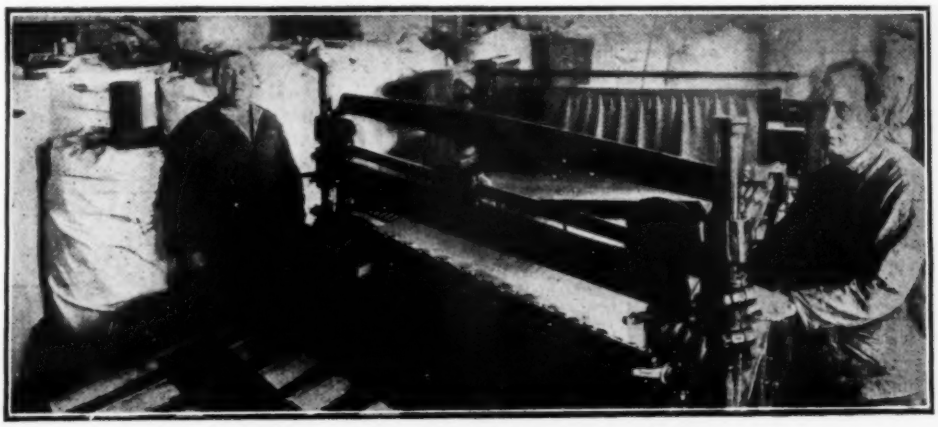
Calender scrap in processing this kind of material is caused by many things. Wrinkles, creases, gum pickups, holes punched in the fabric are common results of poor startups and carelessness in allowing the ends of rolls to sag when going through the machine. Some scrap at the start and finish of a roll is admittedly unavoidable. The large tire manufacturers have recognized this fact and consequently have equipped their calender rooms to handle as long rolls as possible, for the longer the rolls the fewer ends and the less waste. Thus we find the tire fabric mills putting up 500-yard rolls of fabric today where 125 and 150 used to be the regular run. Cord fabric is the hardest stock to calender from the viewpoint of waste, and this holds true whether the factory

impregnates it with gum in solution first or frictions it direct. Great care must be taken to have the rolls wound evenly, tightly, and smoothly on the mandrel, and free from bagginess. Baggy fabric has long been a bugbear on the calender waste report and has been the subject of much discussion between the fabric mill and tire mill. A recent issue of a textile magazine devoted a page to a discussion of "splitting" of cord fabric on the calender, complaints having been received from tire manufacturers of this fault. All were unanimously of the opinion that it was the rubber manufacturer's fault, due to the hardness of his compounds or careless handling of the rolls.

This is a trifle unfair. Any rubber man will tell you that it takes a calender man with brains and experience to friction cord fabric successfully; but even the best calender man in the world cannot do it unless his fabric is put up for him properly and he has the proper facilities to mill up his compound well. Most tire mills figure that a calender waste percentage of one half of one per cent is a good performance.

Waste Through Cutting

The next process which creates fabric and gum waste is cutting, which is performed on a bias cutter for cord and builder fabric, on a clicking machine for tube patches and on a slitting machine for flap stock.



Cutting Strips of Tire Building Fabric on the Bias Cutter

Theoretically, the only waste that should occur at the bias cutter is a triangular piece of stock about a foot and a half long, which is unavoidable at the start and finish of each roll. Here again the tire manufacturer found that by doubling the length of his rolls and installing machinery to handle the larger unit, he cut his waste in half, the same as at the calender. Some other waste does occur at the bias cutter, due to poor condition of the machine, dull knives, or carelessness in setting the ply width, but all of these things are unnecessary and should be eradicated. In fact, before anything can be accomplished in holding the waste figure down, absolute safeguards must be taken to determine that the ply widths are correct.

Cutting bead and flap stock on a slitter should produce practically no waste if the width of the stock is figured out exactly to fit the requirements. Cutting tube patches on the clicker can very easily run into undue scrap percentages if not watched, owing to the smallness of the dies. Here is a case, as in footwear cutting, where every thirty-second of an inch closer that each cut is made to the other means another patch out of each row across the stock. A job like this can very easily be put on bonus.

The biggest item of waste in making a tire comes in the fabric that the tire builder trims off. It also is the most important, since it serves as a very decisive index as to the quality of the tire. For, granting that the ply widths are designed and cut correctly, the builder who has a large trim is stretching his plies too much, rendering the carcass taut and liable to break under strain. On the other hand the tire builder whose trim is practically negligible is not stretching his plies enough and may cause a wrinkled ply in the tire.

An idea of the importance of this waste item can be gained by the fact that the large tire companies keep detailed records of the number of ounces of fabric trimmed from each tire by each builder daily. These figures are constantly checked up and watched by waste specialists. If one builder's trim runs consistently high and another's consistently low, the men are made to swap machines, so that it can be determined whether it is the machine or the man which is causing the trouble. The amount of trim on a cord tire runs from 4 to 7 ounces according to size, and figures about four per cent of the fabric processed.

Uncured builder, cord fabric, and breaker strip scrap are usually combined under the one classification of pure gum friction for salvage. This grade of scrap is always in demand owing to its high rubber content and when reclaimed is used often in heels and soles. It is an attractive reclaim for all purposes because it can be used as rubber which has already been milled. Pure gum friction reclaim is now quoted at 21½ to 22½ cents a pound and the scrap has brought as high as 8 cents a pound within the past year.

Gum Stock Waste

Waste of gum stocks occurs through mixing up of scrap, or getting dirt or other foreign matter in the batches. Mixing up of scrap from treads, tubes, and beads can easily become a disaster, and many cases of soft sidewall or hard treads can be traced to this sort of carelessness. Proper precautions for preventing it are: a central clearing station for all uncured stocks, with bins constructed of wire or metal plainly marked with the number of each stock, and proper instruction of the men who handle the fresh batches and returned scrap. Wood and splinters in tube stocks are a difficulty which will occur as long as rubber is packed in wooden cases at the plantations, but it can be prevented by careful brushing and examination of the rubber when unpacking. The general practice today is to wash all plantation rubbers as well as wild rubbers when used in tube stocks.

Each tire builder should be equipped with a set of pans clearly marked for his uncured gum scrap, and collection and sorting of this scrap should be accomplished under competent direction.

Cured Rubber Waste

Cured rubber waste occurs in tire building, the same as in any molded article, as overflow. From cord tires cured by air bags

the amount is very small; from fabric tires cured on the core it is much larger, but if it is too great it is an indication that the gages are wrong and the tire is probably buckled. This tread overflow or "rinds" is salable at 2 to 3 cents per pound. Overflow from curing beads is worthless owing to high sulphur and low rubber content.

The air bag is a big waste item that came along with the cord tire, and much progress has been made by chemists toward designing a bag which will stand up under a large number of heats. As these air bags cost between four and five dollars to make, it is of prime importance that the maximum number of cures be obtained on each one, and here is a direct method of reducing the cost on each tire, more especially since the air bags are worthless when scrapped. Most manufacturers are recovering and repairing their bags with good results.

Other cured items which can be found on the waste report are tube ends and skivings, which can be kept down to minimum by rolling the tubes to exactly the proper length; bead ends and defective beads; buffings; and semicured casings caused by defective air bags.

The Human Element in Waste

These are the technical aspects of material spoilage in tire plants. There remains the other aspect which may be described as the psychological or human side of the question.

Usually spoilage can be traced to some form of misunderstanding, ignorance, lack of care, or poor judgment on someone's part. The corrective for this is education and instruction. Some plants accomplish this by publishing waste figures and values for the workmen to read. Whenever this method comes to mind it recalls a certain incident which occurred in a tire plant in the east. A foreman posted a notice beside a certain workman's machine showing how much the waste from his machine cost the company in a week. This particular workman being unable to read looked at it blankly and inquired: "Shop on four-day week?" And those who can read such notices often do not understand such terms as percentage. A better method is to put such figures in the hands of the foreman regularly and let him take such steps as are necessary to reduce the spoilage; for he can usually put his finger on the trouble much more effectively than the literature of propaganda.

Waste records kept over a period of time showing the percentages at the calender, bias cutter, and builder form a basis for a series of charts illustrating graphically the progress made in waste reduction. There are certain limits, however, beyond which it is impossible to go in the matter of reducing tire material waste. But when this point is reached, the difficult job is to keep it there. For this purpose the large tire plants have the waste specialist on the job, whose effectiveness is often gaged by how big a pest the foremen think him to be. As one tire superintendent expressed it, he didn't want one of those scrap hounds on his trail; but an examination of his factory showed that perhaps he needed one.

IMPORTANCE OF THE TIRE VALVE INSIDE

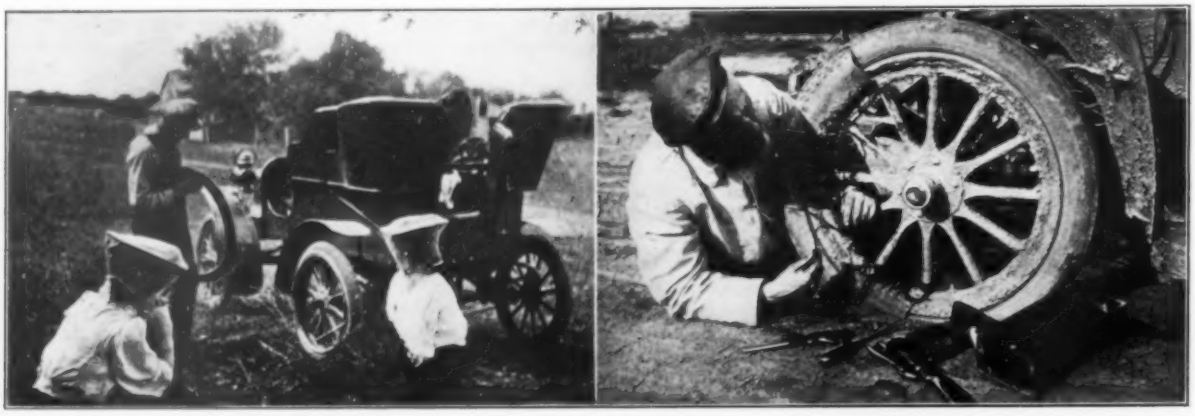
A very important piece of mechanism about one inch long, faced on one end with a rubber plug and surrounded by a small spring at the bottom, plays a vital part in the life of every automobile tire. It is known as the valve inside, which screws into the inside of the valve stem. The valve inside opens to permit the entrance of air during inflation and automatically closes to hold the air within the tube during service. In large pneumatic tires it is called upon to hold back a force of more than 100 pounds, which increases with severe road bumps.

A valve inside usually lasts as long as the casing, but this little piece of mechanism should be watched carefully and kept clean at all times so that it will be in good working condition and will not permit air to escape due to the presence of dirt or muck on the red rubber washer which is the air control seat. If the spring grows weak or the rubber becomes worn or damaged a new inside should be inserted. This can be easily done by using the slotted end of the valve cap.

The valve cap should always be screwed over the mouth of the valve stem by hand. It not only keeps out dirt but acts as a secondary seal against the escape of air. The valve cap is fitted with a dome-shaped rubber washer which is reinforced by an arched brass washer, the latter being vulcanized in the rubber washer. Consequently, downward pressure of the valve cap washer against the mouth of the valve cannot distort the rubber washer so as to depress the valve stem plunger and thus interfere with the correct operation of the valve inside.—A. Schrader's Son, Inc., 470 Vanderbilt avenue, Brooklyn, N. Y.

RUBBER ASSOCIATION INSTITUTES "OLD TIMERS' CONTEST"

As a result of the photographic contest conducted by the Tire Manufacturers' Division of the Rubber Association, many interesting photographs were submitted, these illustrating tire repair methods prior to 1905 and also for the period 1905-1915. E. H. Thompson's photograph, as shown at the left of the illustration, won the prize of $500 for the first period, while James H. Hare gained another prize of similar amount for his photograph representing tire troubles from 1905-1915.



PERIOD PRIOR TO 1905 PERIOD 1905-1915

Winners in Rubber Association Photographic Contest

Engineering Problems in Rubber Footwear Mill Rooms—II[1]

General Mechanical Features—Gears and Pinions—Computations of Size and Speed of Shafts—Safety Equipment—Size of Motors—Winders and Take-Offs—Ventilation

By Alfred B. Lingley, B.S., Ch. E.

It will be noted that direct current motors are used for variable speed work, and alternating current motors for constant speeds. The latter are used when possible in order to avoid commutator trouble.

All motors, with the exception of those for suction fans, are provided with reverse switches. If necessary to stop the machinery when filled with stock, the motor is reversed and the stock removed.

If reverse switches are not provided, the stock must be removed before starting the motor as the load is likely to be too great for the motor. In case the mills and calenders should remain idle long, the stock hardens and if it is not removed a broken mill or calender may result. Removing the stock in this manner requires considerable time, consequently a loss in production, machine time, and labor.

All drives are reduction gears enclosed in oil-tight casings. Such a drive is believed to be better than a chain drive for three reasons: (1) less noise; (2) less space; (3) cleaner. A good chain drive does not give any more maintenance trouble than a gear drive if properly installed.

The reduction gears are herringbone, because of their smooth-running qualities. The pressed upper calender and the lining calender are equipped with herringbone gears. On these two types of stock it is very desirable to avoid gear marks. The use of herringbone gears eliminates back-lash and gives as smooth a stock as it is possible to obtain. The gears for friction motion on the lining calender are not herringbone. Such gears are not required for friction stock and would be unnecessary expense.

The master gears and pinions are cut gears. The initial cost will be much higher than cast gears, but this will be more than offset by the advantages gained. Cast gears mesh poorly and pounding results. Pinions on rubber machinery, particularly on crackers and mills, are subjected to tremendous shocks. Cast pinions, when subjected to the natural pounding with this type of gear plus the violent strains incurred when stock is placed in a mill or cracker, soon crystallize and break. Broken pinions mean a loss in machine time and consequently in production. All pinions are split as only a short time is required to remove a pinion of this type, but it is a long task to remove a closed pinion.

All crackers are double geared because of the heavy work which these machines are required to perform. All gears are protected by gear housing or heavy iron mesh with angle-iron frame.

Size and Speed of Shafts

The speed of the line shafts will depend on the make of mills and crackers used, probably about 70 r. p. m. It is not good practice to use a shaft for the rubber mill line work smaller than 4 inches in diameter. In calculating the size of the shafting, figures are used which actual experience in the rubber industry has demonstrated to be satisfactory.

All areas in the following computations are cross-section areas. Shafting is calculated per group of three machines. It would not be advisable to have couplings closer than this. On the other hand, longer sections are not necessary. The price of shafting varies directly as the size. By reducing the size of the shafting on a line as often as possible, a considerable saving of money is made.

The first computations are made for the lay-out shown in the previous article,[2] in which each line is driven by one motor. In calculating the size of the shaft, 4½ square inches (cross-sectional area) are allowed for each 20 or 22 by 60-inch mill. Three square inches (cross-sectional area) are allowed for each machine of smaller size.

Computations

LINE NO. 1.

Area of circle $= \pi r^2$
Minimum shaft = 4 inches diameter (standard practice)
Cross-sectional area of minimum shaft $= 3.1416 \times (2)^2 = 12.5664$

It will be well in this case to order shafting on the basis of three machines, as this would be the maximum number on this line.

Adding 3 square inches for each of 3 mills $= 12.5664 + 9 = 21.5664$

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{21.5604}{3.1416} = 6.86$$

$$r = 2.61$$

Diameter of shafting for line No. 1 is 5¼ inches.

LINE NO. 2.

Considering the shafting from the drive to the right:
Minimum shaft = 4 inches diameter (standard practice)
Cross-sectional area of minimum shaft $= 3.1416 \times (2)^2 = 12.5664$
Adding 4½ square inches for each of 3 mills and 3 square inches for each of 3 mills $= 12.5664 + 13.5 + 9 = 35.0664$.

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{35.0664}{3.1416} = 11.16$$

$$r = 3.34$$

Maximum diameter of shaft from drive to the 16 × 45-inch mill on the extreme right is 6¾ inches. Shafting 6¾ inches in diameter is laid from drive to the first three mills on the right, namely: 16 × 45, 20 × 60, and 16 × 45-inch mills.

Cross-sectional area of minimum shaft = 12.5664.

Adding 3 square inches for 1 mill and 4½ square inches for each of 2 mills $= 12.5664 + 3 + 9 = 24.5664$

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{24.5664}{3.1416} = 7.81$$

$$r = 2.79$$

The required shafting for the three mills on the extreme right, namely: 20 × 60, 20 × 60, and 16 × 45-inch mills, is 5⅝ inches in diameter and is coupled to the 6¾-inch shafting.

Considering the shafting from the drive to the left: This side of the line has the same number and same sized mills as the other side. From previous computations, the maximum diameter of the shaft is 6¾ inches.

Shafting 6¾ inches in diameter is laid from drive to the first three mills on the left, namely: 20 × 60, 16 × 45, and 20 × 60-inch mills.
Cross-sectional area of minimum shaft = 12.5664

[1] Continued from THE INDIA RUBBER WORLD, November 1, 1923, page 79.

[2] THE INDIA RUBBER WORLD, November 1, 1923, p. 79.

Adding 3 square inches for each of 2 mills and 4½ square inches for 1 mill = 12.5664 + 6 + 4.5 = 23.0664

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{23.0664}{3.1416} = 7.34$$

$$r = 2.70$$

Diameter of shaft for the three mills on the extreme left is 5⅖ inches, and is coupled to the 6¼-inch shaft.

LINE NO. 3.

Considering the shafting from the drive to the 15 × 24-inch cracker on the extreme right:
Minimum shaft = 4 inches in diameter (standard practice)
Cross-sectional area of minimum shaft = 12.5664
Adding 3 square inches for each of 3 mills = 12.5664 + 9 = 21.5664

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{21.5664}{3.1416} = 6.86$$

$$r = 2.61$$

Diameter of shaft from the drive to the 15 × 24-inch cracker on the right is 5¼ inches.

Considering the shaft from the drive to the 16 × 45-inch mill on the left:
Diameter minimum shaft = 4 inches
Cross-sectional area of minimum shaft = 12.5664
Adding 3 square inches for each of 5 mills = 12.5664 + 15 = 27.5664

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{27.5664}{3.1416} = 8.77$$

$$r = 2.96$$

Maximum diameter of shaft from motor to the 16 × 45-inch mill on the left is 6 inches. Shafting 6 inches in diameter is laid from the drive to the 15 × 24-inch cracker, and the 16 × 45-inch mill on the left. The required shaft for 3 mills has previously been computed to be 5¼ inches; 5¼-inch shafting for the 15 × 36-inch cracker, 16 × 30-inch refiner, and the 16 × 45-inch mill on the left is coupled to the 6-inch shafting.

LINE NO. 4

Considering the shafting from the drive to the 16 × 45-inch mill on the extreme right:
Diameter minimum shaft = 4 inches
Cross-sectional area of minimum shaft = 12.5664
Adding 3 square inches for each of 4 mills = 12.5664 + 12 = 24.5664

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{24.5664}{3.1416} = 7.81$$

$$r = 2.79$$

Maximum diameter of shaft from drive to the 16 × 45-inch mill on the extreme right is 5½ inches. Shafting 5½ inches in diameter is laid from the drive to the 16 × 45-inch mill, and the 15 × 24-inch crackers on the right.
Area of minimum shaft = 12.5664
Adding 3 square inches for each of 2 mills = 12.5664 + 6 = 18.5664

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{18.5664}{3.1416} = 5.99$$

$$r = 2.44$$

Diameter of shafting for the 15 × 24-inch cracker and the 16 × 24-inch mill on the extreme right is 4⅞ inches. This is coupled to the 5½ inch shafting.

Considering the shaft from the drive to the 16 × 45-inch mill on the extreme left:
Diameter of minimum shaft = 4 inches
Cross-sectional area of minimum shaft = 12.5664
Adding 3 square inches for each of 6 mills = 12.5664 + 18 = 30.5664

$$\frac{\pi r^2}{\pi} = r^2$$

$$\frac{30.5664}{3.1416} = 9.72$$

$$r = 3.11$$

Maximum diameter of shaft from drive to the 16 × 45-inch mill on the extreme left is 6¼ inches. Shafting 6¼ inches in diameter is laid from drives to the first three machines on the left, namely: 15 × 24-inch cracker, (2) 16 × 45-inch mills.

The required shaft for 3 mills has previously been computed to be 5¼ inches. This size of shafting for the 16 × 45-inch mills, and the 15 × 24-inch cracker on the left is coupled to the 6½-inch shafting.

If the unit system is adopted, the shafting on Lines No. 3 and No. 4 will be different. The machines will not be on two lines but will be on smaller units. This means that shafting smaller in diameter will be used.

Safety Equipment

Every calender, mill, and cracker is equipped with a safety bar, operating an electric safety stop on the motor. In case of accident, the operator may quickly stop the machine by moving the bar up or down. Such a device is much more efficient than the individual clutch. Safety equipment must not be neglected. The ability to stop the machinery quickly will often mean the saving of a man's hand or arm.

Calculating Size of Motors

In calculating the required horsepower for driving the lines, the 16 by 45-inch mills and all crackers were rated at 35-40 h.p. The 20 and 22 by 60-inch mills were rated at 50 h.p. In the case of calenders, 25-35 h.p. were allowed for each "banking." These figures were taken from common practice and have been found to give good results. In deciding upon the motor, allowance has been made for possible overload. In the case of the line drives, provision was made for expansion.

Winders and Take-Offs

The winders and take-offs for the three form calenders require careful consideration. Much calendered fabric may be ruined through the inability to regulate the tension properly. This is particularly true in the case of friction and linings. The winders will be driven from the calenders by means of sprockets and chains. Friction disk winders will be used. The wheel for adjusting the tension will be stationary. There are types of winders and take-offs with a revolving, adjusting wheel. When the winder or take-off revolves, the adjusting wheel rotates. When the calender is traveling at fast speed, it is impossible to adjust the tension of the winder or take-off, due to the speed at which the adjusting wheel is rotating. In such a case it is necessary to stop the calender to adjust the tension. The friction disks should be larger than the ones on the market. A friction disk about 16 inches in diameter will enable one to secure a desired tension without excessive strain on the adjusting screws.

Ventilation

Ventilation will be by means of two 6-foot fans. One fan will be located at the partition between Line No. 2 and Line No. 3. The suction pipes from this fan will run over the two lines. Openings in the pipe will be over the 20 by 60-inch mills on Line No. 2, and also between the mills and refiners on Line No. 3 requiring ventilation. The pipe from this fan also goes to the toilet room, where there are two openings. The other fan will be located near the partition between the calender room and the space for the cloth drier. The pipes from this fan will run over Line No. 4, with openings over or between the machines on this line requiring ventilation. There will be two openings in the space reserved for the cloth drier and two in the compound room in front of the compound bins. In the compound room, the pipe will run along the floor. The openings, heavily screened, will be 3 feet from the floor. This will draw the dust down away from the compound weigher.

Space has been reserved for the cloth drier. Although this is not really a part of the mill room, it should be near the calender room in order that the calenders may not be delayed waiting for fabric. Provision is also made for an office for the departmental head. Adjacent to this is a wash room 66 by 30 feet. This is equipped with toilets, wash bowls, shower baths, and lockers for the use of the men in this department.

Printed Linings for Weatherproofs[1]

Double Texture Lining Effects Obtained by Printing Process—Proofing Method—Special Color Press—Hot Curing Weatherproofs—Advantages of Printed Linings

THE familiar macintosh or double texture weatherproof coat comprises two plies of rubberized fabric doubled together and vulcanized before making up. It is naturally heavier than a single texture coat and perhaps better for some uses. That it has its special desirable qualities is evidenced by the fact that raincoat manufacturers make a strikingly good imitation of the real double texture garment by substituting for the fabric lining a plaid effect printed upon the proofed or under side of the coat as an imitation lining.

A few of these printed plaid designs are illustrated herewith. These may be printed in combinations of colors upon colored grounds and produce very pleasing effects with great saving in cost over a lining fabric.

The manufacture of weatherproof fabric with printed plaid lining involves the process of rubberizing by spreading, followed by printing with rubber colors on the plain proofed ground and subsequent vulcanization.

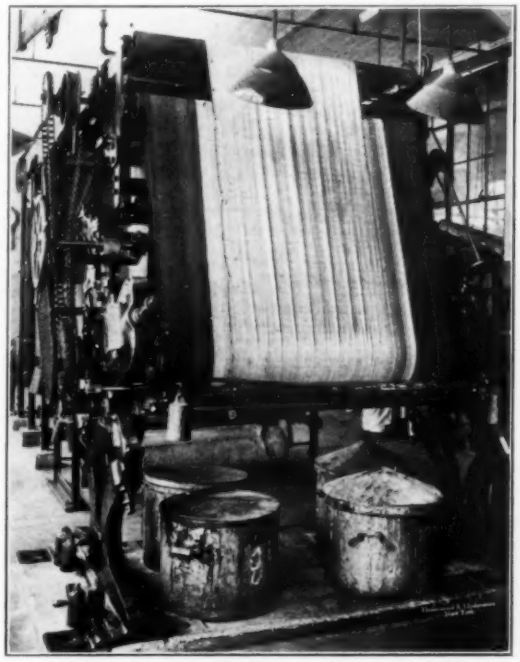
Proofing Process

Briefly, the proofing process includes the usual mixing of the rubber composition on ordinary mixing mills in which the rubber is thoroughly broken down. A rubber mixing for proofing purposes requires special characteristics in order to spread smoothly to gage and remain without inclination to depart from the gage. Also, it must be compounded to secure the maximum aging effect by resisting the hardening effect of oxidation.

The well broken rubber mixing is prepared for use on the spreader by solution in gasoline in a churn of the usual type. From the cement churn the thick flowing stock is received in tubs and conveyed to the spreading machine for application of the successive coatings to the raincoat fabric.

The sticky semi-dough of rubber cement is handled from the tub to the spreader by the operator, who gathers a large mass into a ball in his hands wet with soapy water. In this way he fills the angle between the roll and spreader knife, or doctor, with the soft stock which revolves slowly on the fabric as the latter passes up over the roller and under the knife.

The proofed fabric then passes with each successive coating of rubber to the farther end of the machine over a series of steam pipes radiating heat, which expels the volatile solvent. The fabric returns to the first end of the machine fully freed of gasoline and is rolled up on a shell under that from which it started. After a sufficient number of coatings of rubber cement have been applied the goods are ready for printing.



Cylinder Press for Printing Rubberized Fabrics

Cylinder Color Press

The problem of printing plaids on rubber proofed surfaces for coats has been solved by the use of a modification of the type of printing machine used for wall paper printing. The illustration shows the printing end of machine. Ordinary wall paper is printed by surface printing while rubberized fabric has to be printed from engraved rolls. The machine pictured has three color printing rolls engraved with designs that can be printed in plaid combinations.

The lines of engraving representing the weft threads in the design are cut into the roll surface on a line spiral to the axis of the roll in order that the doctor blade or scraper, which removes the printing color from the surface, may do so progressively along the lines of engraving and not scrape squarely over their full length at the same instant. By this device all wear or damage to the engraving is avoided.

Printing with Rubber Colors

The designs are printed on the rubberized surface with colored thin rubber cement. The colors selected are such as remain unchanged during hot vulcanization. The colors are compounded into white rubber composition which is subsequently ground in a "wet" mill to suitable consistency for use on the press. The wet mill is simply a chilled roll refining mill with rolls and mixing pan boxed with iron plates to retain the fluid mix being ground.

The roll of fabric to be printed is drawn through the machine attached to a cotton liner. In its passage the fabric is backed by an endless rubber blanket which cushions it as it passes over the highly polished engraved rolls and transfers the design in colors. The printing and drying are effected rapidly and the goods are delivered at the farther end of the machine in a roll ready for the curing process.

Vulcanizing Weatherproof Fabrics

Weatherproofed fabrics, whether plain proofed or proofed and printed, are cured by hot vulcanization in chambers heated by radiation from steam coils. Originally the work of draping the goods hung in loops from cross bars of wood was done by hand. It is now done by means of a special machine arranged, if desired, to apply a coating of varnish to the proofed side of the fabric before its entrance into the heater.

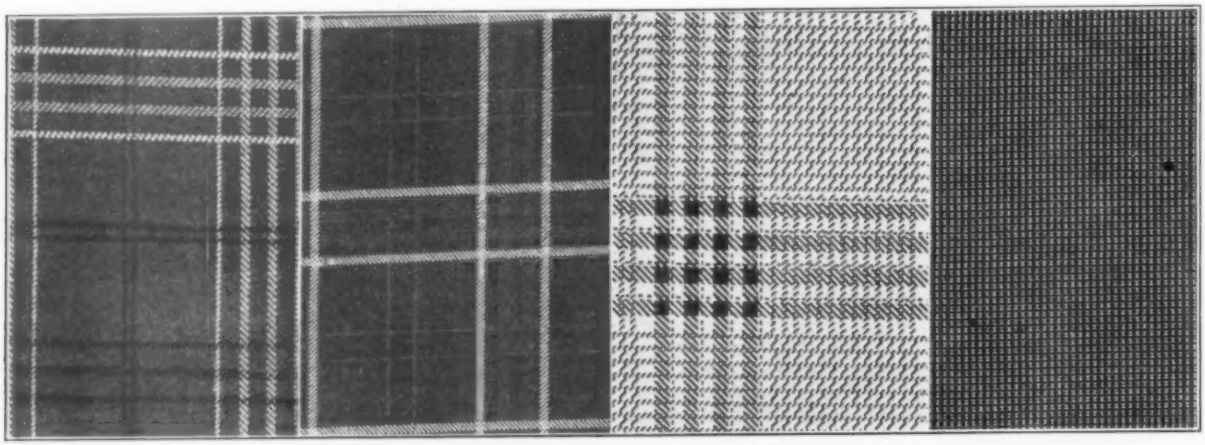
Practical Advantages

Some of the practical advantages of printed linings are economy, wearing quality and ease of cleaning.

[1]Data and illustrations supplied by the Vulcan Proofing Co., Brooklyn, N. Y.

Without doubt economy in manufacture is the leading reason for the development of printed linings. Reduction in cost by the use of light weight open weave fabric linings was carried to the extent of sacrificing both appearance and wear. The cement coat backing underlying the lining frequently showed through and disfigured the face of the lining, while the slazy weave gave only poor attaching surface, and peeling up of the lining resulted in wear.

The substitution of heavier rubberizing and printing saves both labor and material and admits not only the same variety in color and design but eliminates ply separation, affords better service to the wearer and permits easy cleaning of the inside of the garment without injury by any medium suitable for the purpose. The rubber surface also permits secure attachment of rubber patching to repair cuts, and restores the full waterproof effect much better than could be done over the fabric lining.



Plaid Designs of Printed Linings for Raincoats

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(299) We are asked to furnish a list of manufacturers of rubber reducing garments.

(300) A subscriber asks for addresses of manufacturers of interlocking rubber tiling.

(301) A company in Scotland is desirous of communicating with American manufacturers of porcelain forms for glove dipping.

(302) A correspondent in Paris, France, desires to get in touch with American manufacturers of bathing caps and dipped rubber gloves.

(303) Inquiry is made as to a metal cleaner for cleaning steel molds used in making hard rubber products.

(304) We are asked to furnish addresses of manufacturers of solid rubber balls.

(305) A subscriber requests the name of a manufacturer of a ring rolling machine for dipped rubber goods.

(306) A correspondent wishes to get in touch with a manufacturer of rubber gaskets for use on hydraulic presses of 2,000 pounds pressure per cubic inch.

(307) We are asked for a list of manufacturers of rubber sponges.

(308) A subscriber asks for addresses of manufacturers of unlined linen fire hose.

(309) Information is asked concerning a source of supply of high grade hard rubber dust.

(310) Inquiry is made as to a producer of dipped goods benzol with a specific gravity of 0.865 at 15.5 degrees C.

(311) Inquiry is made for a machine to shred smoked Pará rubber sheets and for a machine which will assist in putting the shredded rubber in solution.

(312) We are asked for the address of a manufacturer of mold wash.

Foreign Trade Opportunities

Address and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
8001	Spain—Rubber shoes and automobile tires	Exclusive agency
8081	Australia—Crêpe rubber sheets for shoe soles	Agency
8116	France—Rubber soled canvas shoes	Agency
8117	Czechoslovakia—Rubber soled canvas shoes	Purchase and agency
8118	England—Thigh and knee rubber boots	Purchase
8123	Canada—Rubber toys	Agency
8139	Norway—Tires	Purchase
8140	Sweden—Gloves and stockings and other rubber specialty articles	Purchase
8158	Rumania—Rubber footwear and mechanical rubber goods, tires and accessories	Agency
8177	Italy—Hip and short rubber boots and lace shoes	Agency
8188	France—Rubber shoes and soles	Purchase

Trade Lists Available

Mimeographed copies available on reference to titles and file numbers.

NUMBER	COUNTRY AND COMMODITY
EUR-3059	France—Rubber-soled canvas footwear...Importers and dealers

ENGLAND'S PURCHASES OF AMERICAN RUBBER BELTING, WHICH during the year 1922 totaled only $32,289, have greatly increased during the present year, the figure for the first eight months of 1923 being $51,971.

Rubber Lined Ball Mills in Mining and Cement Industries

The Portland Cement Industry—Tube Mills Described—Types of Metal Linings—Rubber Linings in Ore Grinding—A Recent Patent—Possibilities in the Cement Industry

IN the manufacture of Portland cement exceedingly fine grinding of cement rock, limestone, coal and "clinker"—their fused product—constitutes a prominent feature of the process. What this means in annual tonnage ground is indicated in the following facts concerning the cement industry.

The Portland Cement Industry

Portland cement was first manufactured in 1824. In the intervening century the industry has grown until the present year's production is estimated at 120,000,000 barrels of 376 pounds net.

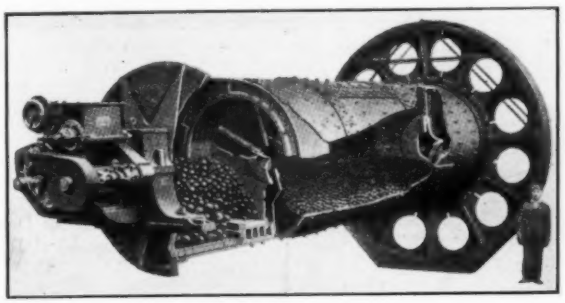


Fig. 1—Compeb Tube Mill

Each barrel represents 612 pounds of material ground to the fineness of flour. Of this amount 462 pounds are cement rock, 149 pounds limestone and 166 pounds coal. For grinding the cement rock and limestone a tube mill is generally used, an improved form of which called a compeb tube mill is presented in Figure 1.

Tube Mills

A tube mill consists primarily of a long revolving cylinder of steel provided with a lining of suitable material to form an inner abrasive surface and protection from wear for the outer shell. The ends of the cylinder are closed by heavily reinforced cast iron heads which have at their centers hollow trunnions through which the material is fed into the mill at one end and discharged at the other.

The cylinder is partially filled with flint pebbles or iron balls which are replenished from time to time as their quantity is reduced by wear. The rotation of the cylinder carries the mixture of pebbles or balls and the material being ground to a certain height within the mill, from which the mass falls, and in falling the pebbles or balls are in constant action against each other, and between them the material is ground by attrition. By this principle of grinding an immense grinding surface is brought into constant action and every particle of material is subjected to uniform and thorough grinding.

The number of revolutions at which the mills are operated depends upon their diameter and the material to be ground. Usually the speed is regulated so as to give the shell a peripheral speed of approximately 400 feet per minute.

Tube Mill Linings

In customary practice the lining for the interior of the shell of a tube mill may be made of silex, ironite, or cast iron applied in sections bolted to the shell. This method of applying the lining is shown in Figure 2, which represents an interior and sectional view of a tube mill with sectional ribbed lining of cast iron. A lining of this type requires about 24 hours for replacement ready for again operating the mill. When a silex lining is placed in the mill it is necessary to allow the cement, which holds it in place, to harden before the mill can be used, a period usually of a week to ten days. This periodic loss of time involves a serious reduction in tonnage, which until recently there seemed to be no way to avoid.

Rubber Linings in Ore Grinding

Tube mill grinding finds extensive application as a process of ore dressing in the mining industry where possibly as much rock is ground as in the cement industry. The cost of linings and the possible increase of grinding efficiency recently led to experiments with thick slabs of tough, wear resisting rubber applied as a lining to a tube mill grinding very hard ore and gangue rock.[1]

After months of practical test it was demonstrated that the innovation of the rubber lining gives results superior to any of the metal and rock linings previously used. These results apparently indicate that tube mills working on cement rock, limestone, and the intensely hard cement clinker might be operated with rubber linings with equally satisfactory results. In such cases the general adoption of rubber for linings would be a new outlet for the mechanical goods industry of no small proportions.

Rubber Linings Patented

The matter of rubber linings for tube mills has been made the subject of a recent patent[2] in the specification of which reference is made to two methods of applying the rubber slabs, one circumferentially and the other longitudinally, as represented in Figure 3.

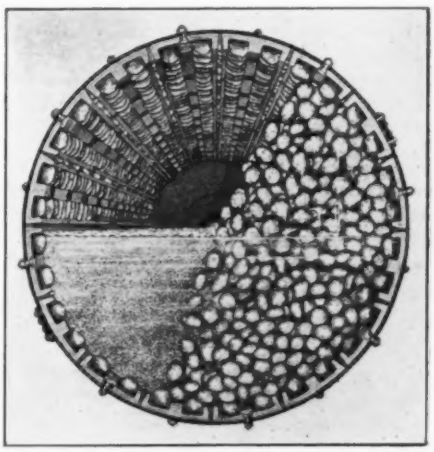
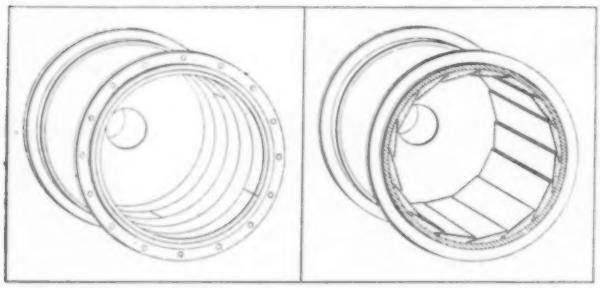


Fig. 2—Ribbed Tube Mill Lining

The grade of rubber recommended is that used for the tread of automobile tires. Such a lining while sufficiently hard to resist wear has enough resiliency to cause the steel balls or other grind-

[1] "Rubber Lined Ball Mills." THE INDIA RUBBER WORLD, August 1, 1923, 697-8. "Rubber Possibilities in the Mining Industry." THE INDIA RUBBER WORLD, November 1, 1923, 87.

[2] United States patent No. 1,470,597.



CIRCUMFERENTIAL LONGITUDINAL

Fig. 3.—Applications of Rubber Linings in Ball Mills

ing medium to rebound upon impact in such manner as to avoid disintegration of the liner surface. Also the rebounding action produces a very marked increase in pulverizing efficiency. Such a lining is much lighter in weight than those heretofore used, consequently the less heavily weighted mill requires much less expenditure of power for operation. The replacement of the rubber lining is a comparatively simple matter and may be effected very rapidly.

Possibilities in Cement Grinding

The number of tube mills required in the Portland cement industry for grinding without doubt totals several thousand. An idea of the enormous tonnage of ingredients handled is gained from the following authentic data:

To make the reported domestic output of Portland cement of 116,000,000 barrels of 376 pounds net each, for 1922 there was required to be ground about 35,500,000 tons of rock and clinker. It is quite impossible to estimate the rubber that may be called for if the practice is adopted of using it for tube mill linings. The possibilities, however, are potentially large in any event, since tube mills run in size from 4 to 6 feet in diameter and from 16 to 22 feet long.

Fall Meeting of Committee D-13

THE fall meeting of Committee D-13 of the American Society for Testing Materials was held at the headquarters of the society in Philadelphia, October 26, 1923, and reports were submitted by sub-committees on the following topics: Proposed Tentative Specifications for Test Methods for Electrical Cotton Yarns; Proposed Tentative Specifications for Tolerances and Test Methods for Cotton Sewing Threads; Proposed Tentative Specifications for Tolerances for Cement Bags; Consideration of the Enlargement of the Scope of Committee to include Sub-Committees on Knit Goods and Wool Goods; and Publication of a Volume Including A. S. T. M. Specifications and Methods of Test for Textile Materials, with Reports and Papers Relating to Them.

Enlargement of Scope

A special sub-committee was appointed to consider the knit and wool goods fields and the advisability of entering these and other fields, and if it decides favorably will appoint sub-committees to represent these new groups. While the primary purpose will be to establish testing methods and specifications for materials to be put to mechanical uses, the development of the work will necessarily be on a broad basis as in the other activities of Committee D-13, and result in rules applicable to fabrics for the manufacture of garments.

Standards, Reports and Papers

A volume comprising the collected standards, tentative standards, reports and papers representing the work of Committee D-13 to the present time has been prepared by the Special Committee on Publications. The volume contains about 90 pages and is a valuable contribution to technical textile literature.

Sub-Committee Reports

The report of Sub-Committee I, on Humidity, was a paper on "The Rate of Regaining Cotton Fabrics," prepared by Prof. G. B. Haven, chairman of the sub-committee. This paper presented the results of original work by Prof. Haven to determine the amount of moisture taken up by fabrics which have been dried preparatory to testing, and the rapidity with which they take up moisture. The conclusion reported was that a period of conditioning of one hour is adequate to insure moisture equilibrium in fabrics not heavier than a light sheeting, while a period of two hours is adequate for the heaviest fabrics.

The chairman of Sub-Committee II, on Fabric Testing Methods, read a letter from S. A. Steere, of the Goodyear Tire & Rubber Co., pointing out the need of more definite methods of testing for osnaburgs, hose and belt ducks, and builder fabrics.

Progress reports were submitted by Sub-Committee III, on Testing Machine; Sub-Committee IV, on Classification and Identification of Fibers and Fabrics; Sub-Committee VI, on Imperfections and Tolerances; and Sub-Committee IX, on Hose, Belt and Numbered Duck.

A paper on "Some Applications of the Index Value in Determining Fabric Quality" was presented by C. J. Burkey, of B. F. Perkins & Sons, Holyoke, Massachusetts.

Sub-Committee VII submitted proposed tentative specifications for tolerances and test methods for cotton sewing threads. These specifications are of interest to manufacturers of weather-proofed clothing, tennis and rubber soled sport shoes and stitched rubber belting. The items covered are strength, size, yardage, twist and balance, running qualities, and methods of testing.

Test Methods for Electrical Cotton Yarns

The importance to manufacturers of electric insulation of standard methods of testing electric yarns is so great that in September, 1922, at the suggestion and with the aid of the Bureau of Standards, a committee was appointed by C. J. Schnelle, representing the Acme Wire Co., which included five buyers, five suppliers, one machinery manufacturer, a representative of the A. S. T. M., and the Bureau of Standards.

At the first meeting a sub-committee was appointed to prepare a tentative test method for electrical cotton yarn, and a report was presented at the second meeting. At this meeting it was recommended and voted to transfer further activity along this line to Committee D-13, on Textile Materials of the A. S. T. M. The tentative specifications for testing electrical cotton yarns are now ready and will prove valuable to manufacturers of insulated wire of different types and to rubber manufacturers who employ braiders or circular looms.

Sub-Committees and Officers

Committee D-13, on testing materials, is divided into the following sub-committees:

Advisory; humidity; fabric test methods; testing machines; classification and identification of fibers and fabrics; nomenclature and definitions; imperfections and tolerances; yarn thread and twine; publicity; hose, belt and numbered duck; cement bag test methods and specifications; membership; publications. The precise designations for the two new sub-committees have not yet been announced.

The complete present personnel of Committee D-13 is as follows:

A. E. Jury, chairman; Kenneth Moller, vice chairman; E. D. Walen, vice chairman; R. T. Fisher, secretary.

The Natural Plantation-Finished Crepe Rubber Sole[1]

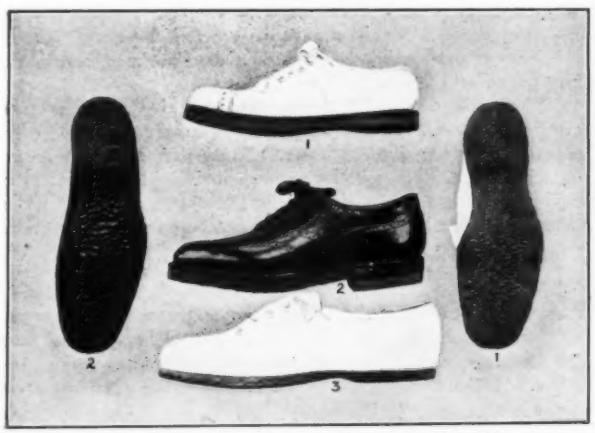
Its Origin, Manufacture, Properties and Uses—Methods of Attachment

Origin of the Crêpe Sole

RARELY has an innovation in rubber or footwear been accorded such spontaneous and immediate success as that which has attended the introduction of natural plantation-finished crêpe rubber as a shoe soling material. While the use of unvulcanized rubber footwear dates back to the early days of the rubber industry before the discovery of vulcanization, the use of crêpe rubber as a soling material is of recent origin in Ceylon.

The material had been somewhat used there for the soling of bush boots, ordinary footwear, etc., and owing to the shortage of vulcanized rubber during the war rubber planters in Ceylon began to utilize it as a soling medium for use on their hard tennis courts. Climatic conditions imposed a severe test, but crêpe rubber proved so eminently satisfactory that both Europeans and natives permanently adopted it, to the exclusion of other types of soles. Its possibilities as a soling medium were quickly realized, and the rubber planters, after considerable experiment, succeeded in producing a special type of crêpe rubber possessing the essential qualities of resilience and durability to a marked degree.

Natural plantation-finished crêpe sole rubber was introduced into England at the International Rubber Exhibition held in London in June, 1921. It was put on the market the following winter, and the next summer was brought to the notice of the sporting public. The prompt and hearty endorsement of champions in tennis, golf, bowls, walking and other sports led to a widespread public demand, with the result that crêpe sole rubber was soon in evidence throughout English speaking countries, including the United States, and elsewhere.

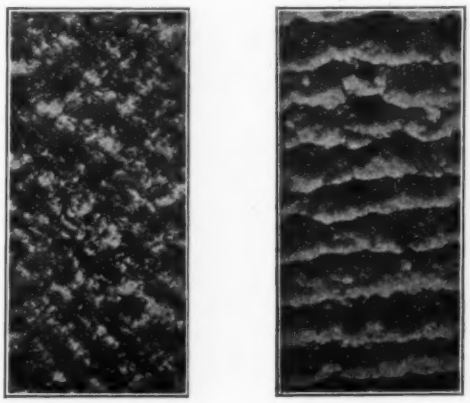


1—1 Tennis Shoes, 2—2 Golf Shoe, 3, Plimsoll

Further Applications for Everyday Wear

Thus crêpe rubber soles have in about two years achieved great popularity for sport and outing wear entirely on their merits, and now are rightly extending their application to everyday footwear. They possess the three principal requirements, comfort, durability and cheapness, and footwear soled with them may be recommended from the standpoint of economy as well as of hygiene.

The very qualities which render them unrivaled for sport shoes make them equally desirable for ordinary wear, and the demand for them will be enormous as the public becomes more familiar with their numerous advantages. Their economy makes a strong appeal, likewise their hygienic characteristics and suitability for winter and wet weather wear. All persons much on their feet are benefited by them, and so the army, navy, police and other government and municipal services are trying them out. Postmen, railway workers and artisans, nurses, agricultural laborers, hunters, and school children are a few of the many classes of persons among whom crêpe rubber soles promise to become increasingly popular. Success also seems to await a cheap crêpe rubber sandal suitable for native wear among the teeming populations of the East.



SMOOTH—FOR TENNIS, BOWLS, BADMINTON

CORRUGATED—FOR GOLF AND GENERAL PURPOSES

Types of Natural Crêpe Sole Rubber

How Crêpe Sole Rubber Is Made

Natural crêpe sole rubber differs greatly from the pale crêpe of ordinary commerce, as it is specially milled on the plantation with infinite care for uniformity of texture and surface, and accuracy in respect to thickness. It is, however, 100 per cent pure, uncompounded, new, live rubber with all its natural "nerve," resiliency, and durability unimpaired.

The rubber is obtained by tapping the rubber tree in the usual manner. The latex thus obtained is coagulated or curdled into a mass like a junket. This mass is rolled out into very thin sheets 1/64 to 1/32 of an inch in thickness between grooved rollers under great pressure. During the rolling process water plays on the rubber and all impurities are washed away. The rubber at this stage is pure white in color.

The sheets are then subjected to a drying process, which yellows them slightly, and are afterward remilled together and built up to the required thickness, following which they are cut to shipping sizes. The rubber undergoes no further manufacturing processes and is therefore cheap. Milling or building up immediately after the drying process insures the requisite texture and cohesion, the durability and resiliency peculiar to plantation-finished crêpe sole rubber.

It will be gathered from the foregoing that any error in rolling the thin sheets to exact and even thickness will be reflected in an uneven thickness of the finished sheets. Crêpe sole rubber is supplied in the following thicknesses: 1/16, ⅛, ¼ and ⅜ inch. The

[1] Data and illustrations used in this article furnished by the Propaganda Department, Rubber Growers' Association, Inc., London, England.

remilled sheets are trimmed into shipping sizes, the size most generally adopted being 36 by 13 inches. They are carefully inspected one by one and then packed in cases in such a manner as to prevent sticking together.

Crêpe sole rubber is made in a variety of corrugations. For tennis, bowls, badminton, etc., the surface can be practically smooth and still maintain, without the slightest damage to the finest turf, a grip which is given by no other soling medium. The coarser corrugations are suitable for golf shoes, everyday and heavy wear.

Properties of Crêpe Sole Rubber

Natural plantation-finished crêpe sole rubber possesses a peculiarly firm and "gristly" texture which gives it a durability and economy unequaled by any other soling medium and which serves to distinguish it from other varieties and imitations. Despite its toughness it is appreciably lighter than other soles, not only in weight but in feeling. This point is important, as the lightest material does not always feel so in use.

Crêpe sole rubber gives an unequaled grip under all conditions, and for sport shoe soles its grip on the turf prevents damage to greens by slipping. Its grip also renders it eminently suitable as a soling for winter footwear. Add to this the fact that crêpe sole rubber is waterproof and it may be literally described as an armor against accident and illness.

How to Use Crêpe Sole Rubber

Various firms have evolved different methods of utilizing crêpe sole rubber, based on individual experience. However, the following information should furnish sufficient data to enable footwear manufacturers to work along the right lines.

Cutting, Working and Storing the Soles

Crêpe rubber is easily cut by means of ordinary leather sole presses, or by knives or shears with the blades first dipped in water. Some firms heat the rubber in order to render it as soft as possible for working, but this is a dangerous process and care must be taken that the rubber does not become sticky. Others prefer it hard, as its appearance is better. In winter crêpe rubber is likely to be harder than in summer. Being an unvulcanized product it is affected by undue heat or cold, but under common sense treatment it is unaffected by ordinary variations in temperature. It is advisable to stock crêpe soles in a room where normal temperature is maintained, and it would be as foolish to dry crêpe rubber as leather soled shoes near a fire.

Attachment Precautions

In manufacturing shoes to be soled with crêpe rubber, fleshy leather should not be used. The leather surface should always be first scoured and if necessary rendered completely free of grease. A sponging with petrol is effective if the leather shows signs of greasiness or "sweating." Heels should be built up of rubber. Heel pieces put on as a last layer to leather heels are not satisfactory, as the nails interfere with proper adhesion.

Complete adhesion of the rubber sole to the leather shoe is all-important and should receive careful attention at the point of the toe, where, if possible, no nails or waxed thread should be used. Even covering of the entire surface of both leather and rubber with solution is essential so as to leave no spaces which may become air pockets. The pressure on such air pockets when the shoe is in use forces them steadily toward the edges, separating the rubber from the leather as they go.

Methods of Attachment

Practice varies, but two principal methods are in use. The more common is to solution and stitch on a thin sole of crêpe rubber, and then solution a thicker one to it. This is known as the two-piece sole. It is a moot question whether this preliminary stitching is necessary.

The second and less common method consists of direct fixing of a single-piece sole with rubber solution. Firms of long experience in the use of rubber and rubber solutions in the manufacture of sport shoes have had no trouble with crêpe soles so fixed becoming detached. Stitching through a single-piece sole so that the stitches come into contact with the ground is not to be considered, as the stitches quickly wear through and dissatisfaction results. Footwear manufacturers lacking rubber experience are naturally apprehensive of solutions, but there should be no failure if the following instructions are carefully observed.

Instructions for Attaching Crêpe Rubber Soles

Single Sole Process

1. Remove all signs of grease and roughen the leather sole of the boot or shoes.

2. Apply one or two coats of cement solution to the leather sole. Each coat must be perfectly dry before another coat is applied. This preliminary coating must be quite dry before any attempt is made to fix the crêpe rubber sole.

3. When the first coating is perfectly dry, apply a final coat to the boot or shoe and apply one coat to the crêpe rubber sole. The solution must be applied to the rubber immediately after the final coat has been put on to the leather. Keep solutioned surface away from direct sunlight, which is detrimental to all rubber solutions. All solutions must be spread evenly.

4. As soon as the final coat on the boot or shoe and the single coat on the crêpe rubber sole become thoroughly "tacky" or "sticky," that is to say, neither wet nor dry, and will come away on the finger in fine hairs, the two sticky solutioned surfaces must be placed together. The secret of success lies in determining the right moment at which to bring the two solutioned surfaces together. It is important that the pressure should be properly and evenly applied. After putting the two solutioned surfaces together, apply pressure from the center outwards with the hand or a roller and press firmly in order to expel all air while the necessary contact between the two solutioned surfaces is being made. Every endeavor should be made to prevent air blisters.

5. Place boot or shoe on a last, not too tight a fit, and lightly hammer all over.

6. Trim the edges with a wet knife, and give a final pressing around the edges. A smart finish can be given by beveling the edges and applying one of the stains which have recently been put on the market. These stains are prepared in black, brown, or white, and are absolutely fast colors and impervious to water. The stain will also receive ordinary boot polishes and dressings.

Double Sole Process

The ⅛-inch sole should first be solutioned to the leather, as already described, and then sewn through the welt. The second sole, of whatever thickness is required, should be solutioned over the first, covering the stitches, one coat of solution being used on each rubber surface and allowed to become thoroughly sticky before fixing them together.

Special Hints to Repairers

Crêpe sole rubber can be more easily worked in a pliable state. Sometimes it is hard and stiff owing to atmospheric conditions, and it should then be *slightly* warmed or placed in a warm atmosphere, when it will rapidly become pliable and easy to work with. It will recover its hardness on exposure to cold, and these changes do not affect its quality in any way whatever.

It is useless to put rubber soles on a bad foundation. See that leather middles, welts, etc., are sound before putting on new soles.

When fitting new middles, always arrange to have the flesh side of the leather outwards so as to provide the rough side to receive the rubber sole.

Do not attempt to fix rubber soles on any leather that is greasy, for rubber and grease are natural enemies.

Do not use crêpe rubber heels on walking boots or shoes unless the crêpe rubber is built up over ½-inch thick, as in the case of golf shoes.

A Constant Load Rate Testing Machine for Textiles[1]

Structural Features—Electric Drive—Principle of the Testing Machine—Recording Mechanism—Advantages in Textile Testing

By Professor George B. Haven[2]

THE major portion of this interesting and valuable paper devoted to a description of a new type of fabric testing machine is here given.

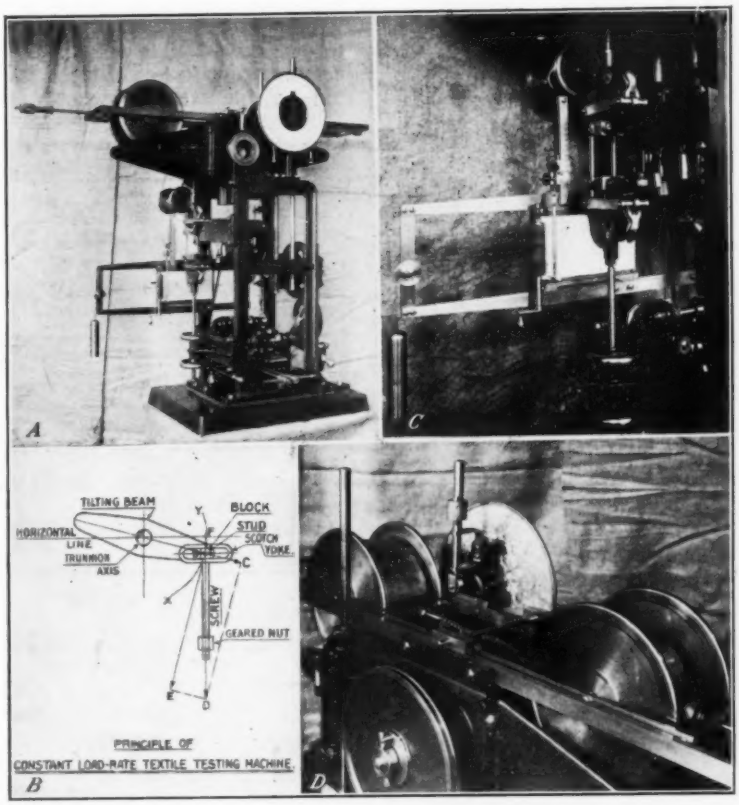
Cotton is highly hygroscopic. This absorbed moisture makes a vast difference in the strength of the product, sometimes amounting to 50 or 60 per cent. Therefore a standard atmosphere has been universally adopted for textile testing and it is no longer expected to obtain accurate results without a limited atmospheric condition.

Features of the Tester

The new type of testing machine shown at A in the illustration has many adjustments, speed changes, and other variations which would not appear in the commercial form. At the top of a rectangular frame are provided heavy ball bearings for the trunnion axis of a tilting beam. The latter moves with very little friction and is nicely balanced so that it can be made to swing through certain angles promptly and with negligible internal strains. The tilting beam provides an inclinable rectilinear track along which roll heavy cast iron disks. These constitute the load element of the machine and are yoked to a chain which runs over a guide pulley and downward in a vertical direction to the upper jaw.

When the tilting beam is horizontal there is naturally no pull upon the jaw chain. As the inclination of the beam upon its trunnion axis increases, the component of the disk weights increases similarly and produces a greater and greater pull upon the upper jaw. If it were possible to swing the tilting beam to a vertical position the full weight of the disks would be thrown upon the specimen. The weights are at all times free to travel down the inclined plane which the tilting beam constitutes, but the pull on the jaw chain depends upon the angular inclination of the tilting beam.

In the event of a rigid specimen the disk weights would remain near the top of the inclined plane. With a stretchy specimen between the jaw, the weights would automatically assume a position farther down the inclined plane. Provided, however, that the angular inclination of the beam was the same in these two cases, the pull on the specimen would also be identical.



(A) Front of Constant Load Rate Tester. (B) Principle of Machine. (C) Fabric Jaws and Recording Mechanism. (D) Rolling Disks and Yokes.

The adjustable lower jaw of the machine is wholly stationary and merely holds the lower end of the specimen. By means of the upper jaw the load is applied in the manner described, and by measuring the inclination of the beam the amount of the load may be determined. In this manner the stretch of the fabric is automatically taken up and the fabric rate of load may be made uniform and of any desired amount, whatever the character of the fabric.

Electric Drive

An electric motor suspended from a bracket upon the left side of the machine furnishes the power for driving a train of gears near the base of the machine. A clutch is included in this gear train in such a manner that the action of the machine may be stopped promptly at any desired point and again the tilting beam returns speedily to a horizontal position.

The driving mechanism at the base terminates in a typical change gear train at the extreme right of the machine. By this means a large variety of speeds may be transferred from the driving motor to a geared nut upon a long vertical screw in the upper right hand position of the machine. This screw terminates at its upper end in a slotted crosshead or Scotch yoke. The block in the slotted crosshead is pinned to a stud set rigidly in the tilting beam of the machine. The position of this stud is therefore fixed with relation to the main trunnions of the upper beam and describes a circle about the center of the trunnion as the beam tips.

If the screw be given a uniform vertical velocity by the gear train, the Scotch links will be drawn down at a uniform rate and the main beam will be tipped upon the trunnions in such a manner as to give a uniform rate of increase to the pull upon the fabric.

The principle of the constant load-rate mechanism is shown at B in the illustration.

[1] Read at the American Society for Testing Materials, Atlantic City, New Jersey, June 28, 1923.

[2] In charge of the textile laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Principle of Constant Load Tester

If the vertical screw is given a uniform rate of travel, FB, then the rate of increase in the load BC will also be uniform. The motor of the gear train will impart to the vertical screw a uniform downward velocity and then, by means of the Scotch yoke, the tilting beam and trunnions will impart to the fabric a uniformly increasing load. The rapidity with which this load is applied may be set at any reasonable and desirable rate by establishing a suitable rate of advancement for the vertical screw. The change gears provided with the experimental machines are such as to give a rate of load varying from 68 to 240 pounds per minute.

Recording Mechanism

Referring to the machine shown at A in the illustration, the recording mechanism consists of a horizontal sliding platen on which is mounted a pad of cross-section paper. The horizontal movement of this platen is derived from the mechanism applying the load and reads naturally in uniform increments. The vertical motion of the pencil is derived from the stretch of the fabric and indicates for every load the precise amount of extensibility in the specimen. The rupture of the fabric is not only plainly indicated to the eye but is similarly recorded upon the diagram. The determination of the amount of the strength does not depend, as in a pendulum type machine, upon ratchets or other mechanism to hold the weight in its highest position. The operation of the machine progresses smoothly and rapidly until the fabric is totally ruptured, and the diagram then gives the final and maximum strength.

An enlarged view of the fabric jaws and recording mechanism is shown at C in the illustration. By adjusting the lower jaw the machine is adapted to any reasonable length of specimen. The jaws are of the flat swinging anvil type and are closed very quickly by depressing upon each a latch fastened to an eccentric sleeve inside of a ball bearing. The tightness of grip for various thicknesses of fabric may be adjusted by a small worm and wheel and eccentric sleeve in the rear jaw.

An enlarged view of the rolling disks and yokes at the top of the machine may be seen at D in the illustration. The manner in which the loading component is transferred from the rolling weights to the specimen by means of the chain is also plainly shown.

Advantages of the Machine

The new type machine is destined to become the permanent form of apparatus for testing textiles. The points of excellence in its design and operation are as follows: (1) The rate of application of the load is uniform whether the specimen is long or short, rigid or stretchy, weak or strong; (2) it makes but very little difference what rate of load application is actually chosen. An official rate may be adopted, but other rates will give results within two or three per cent of one another if used; (3), the charts present an indisputable record of the strength, cannot be tampered with, and a novice can read them; (4), variations in tensile strength in a given fabric are much less in the new form of machine than in the pendulum type and therefore the results may be expected to be more accurate.

JAPAN BECOMING IMPORTANT MARKET FOR AMERICAN TIRES

Japan's tire imports from the United States for the year 1922 amounted in value to only $123,792. For the first eight months, however, of the present year a great advance has been made, the figure for such casings being $348,526. It should also be noted that Japan's August purchase of these tires, at $68,252, represented the second largest importation on the list, the figure being outdistanced only by that of England.

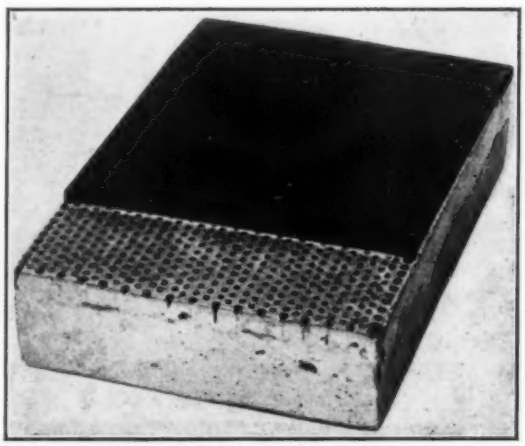
"Rubber Machinery," by Henry C. Pearson, should be in the library of every rubber company.

Novocrete Rubber Paving

The effort to extend the field of usefulness of rubber in a large and practical way is finding expression in the active development of rubber pavement in various forms. One of the newest rubber paving blocks comprises a layer of cured tough wearing rubber which is bonded mechanically to a special concrete base. The illustration shows this paving brick with the rubber in part cut away from the surface to the stony base.

The special feature of the molded rubber is that its under surface is closely studded with short cylindrical projections spaced equal distances apart. The area occupied by the projections is from one-half to two-thirds that of the surface from which they spring, thus affording ample holding surface for secure attachment to the cement base.

The rubber composition is first molded and cured in rectangular forms. The block is formed by placing the molded rubber face downward in a mold, pouring in upon the upturned projections



Novocrete Rubber Paving Block

a layer of neat cement grout sufficient to submerge the teeth. The block is completed by the addition of enough of the special concrete mixture to fill the mold. The completed block is removed after a period of eight hours allowed for setting.

The Novocrete is a patented variety of concrete made from Portland cement and wood sawdust mineralized to prevent swelling by absorption of water. It is extremely cheap, light weight and durable.

The paving blocks are laid on a concrete road foundation in sand and mortar, the sides of each block as laid being wiped with thin cement. The surface joints between the rubber are filled with hot thin asphaltic binder to exclude water, etc. For road paving the rubber face is ¼ inch thick and for sidewalls ⅛ inch thick.

Service tests have demonstrated that the attachment of the rubber to the novocrete is not loosened by the heaviest traffic, no tendency on the part of vehicles to skid is noticed either with rubber or steel tires, and the noise of traffic is practically eliminated.

NATIONAL WASTE DEALERS ORGANIZE NEW DIVISION

The Southern Division of the National Association of Waste Material Dealers, Inc., 1109-1112 Times Building, New York, N. Y., was organized on October 30 at a meeting held at the Signal Mountain Hotel, Chattanooga, Tennessee. S. C. Weber, of Chattanooga, acted as chairman, and an address was made by Mr. De Groat, president of the association, who reviewed the organization's history and pointed out the various services which it was in a position to render to southern members.

Clay in Rubber Compounds

Low Volume Cost—Use with Accelerators, Gas Black and Zinc Oxide—Abrasive and Tensile Values

CLAY has been brought prominently forward in recent years as a rubber compounding ingredient of marked technical value and economy. Published information concerning its value and proper use is meager but favorable.[1]

A rubber expert well versed in the manufacture of clay and its use as a rubber compounding ingredient makes evident its advantages in the following reply to the question, Why is clay desirable in rubber goods and how ought it to be used?

Clays differ much in hardness or resistance to grinding and it should be noted at the outset that only those of hardest quality suited for the manufacture of porcelain have special merit in rubber compounding. The value of clay in rubber stocks is primarily its influence on the tensile properties of the rubber product and its resistance to abrasion. These advantages are secured at much lower cost with clay than with any other reinforcing ingredient. In this respect clay is in a class apart from all other inexpensive fillers and by reason of its economy and behavior is gaining steadily in popularity over the more expensive reinforcing pigments although it is not destined to supersede them.

Economy

Clay holds a strong position as regards saving in cost over many other basic ingredients, due to the fact that its volume cost is only a fifth that of crude rubber, one quarter that of gas black and one-ninth that of zinc oxide. Whiting, although it shows somewhat lower volume cost than clay, functions only as a filler in rubber stocks, contributing virtually nothing to their physical qualities.

Clay and Accelerators

In the matter of quality several points should be considered in using clay. First comes the question, What is the proper accelerator to use with clay? It is known that some accelerators behave much better with clay than others do. For example, thiocarbanilide by itself is worthless, and ethylidene aniline is not at its best with large quantities of clay, whereas hexamethylene tetramine, super sulphur No. 2, diphenyl-guanidine and others give good results where clay is present.

Clay and Gas Black

Gas black is unrivaled as a black pigment and reinforcing ingredient in rubber compounding, producing stocks that show high tensile properties and unique resistance to abrasion. No substitute is at present known for gas black although properly prepared clay may be considered the nearest approach to it in the matter of assisting the physical properties of rubber stocks. This is made plain by the following observations and examples of the substitution of clay for gas black.

In any stock in which it is proposed to use clay and gas black, suitable relative proportions of each should be maintained. Clay not being an absolute substitute for gas black, sufficient of the latter should always be present. On account of the scarcity and high cost of gas black during the past few years rubber manufacturers have sought to reduce its proportions in their stocks; there is a desirable minimum of gas black, however, that should be retained.

Clay and Zinc Oxide

Good hard clay is a substitute, on a volume basis, for ordinary zinc oxide and when properly compounded with gas black gives a stock equal in wearing quality to zinc oxide-gas black stocks. For example, in the skeleton formula for tire tread—rubber 55, gas black 12, zinc oxide 30—which represents the base of a typical high grade tread, two-thirds of the zinc oxide can be replaced with an equal volume of clay with any accompanying change in acceleration desired, making the formula read thus: rubber 55, gas black 12, zinc oxide 10, clay 9. Even large amounts of clay can be used to advantage in such a mixing.

Clay is a slight retarder of cure and therefore it stands higher sulphur and more overcure than zinc oxide does. A proper balance of sulphur, accelerator, and time of curing will give the results desired in clay stocks.

Clay and Abrasive Value

It is commonly believed among compounders that a high grade stock must possess a knotty fiber for high resistance to wear. A stock with high content of gas black and zinc oxide has this characteristic fiber and one might look naturally for a similar condition in a clay compound designed for wearing quality. As a matter of fact, clay does not give a traditional stock in this respect, and this fact has delayed somewhat its acceptance by the rubber industry. Although with some special non-skid designs and tire constructions the feature of knotty fiber should be considered, in general no ill effects result from its absence. No necessary relationship exists between knotty fiber and resistance to abrasion. Thus one of the traditions of the compounders is discredited.

Clay and Tensile Properties

Tensile and elongation values given by clay are, as a rule, slightly less than those given by zinc oxide, although in some cases the tensile is the same or even greater in certain clay stocks. Here also there is no relation between tensile and abrasive resistance. What is desired in slow wearing stocks is not mere tensile strength but rather the reinforcing or toughness and stiffening effect at the lower elongations which hard clay does give in notable degree.

In a comparatively brief space of time clay has won a place in the rubber industry due to its showing from the standpoints of economy and physical qualification. In fact, clay may be considered nearly as important as gas black in the technology of rubber. With increasing competition in the rubber industry clay should not be overlooked. It is a material that when properly used will lower costs and maintain quality.

[1] E. L. Davies, *India Rubber Review*, October, 1922. C. O. North, *Journal of Industrial and Engineering Chemistry*, September, 1922.

AMERICAN MANUFACTURERS' EXPORT ASSOCIATION ELECTS OFFICERS

At the fourteenth annual convention of the American Manufacturers' Export Association which was held October 24, 25 and 26 at the Waldorf-Astoria Hotel, New York, N. Y., the following were included in the executive personnel as elected for 1924: president, W. W. Nichols, president of Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin; and E. H. Huxley, president of United States Rubber Export Co., 1790 Broadway, New York, N. Y.

IN COMPARING THE AMOUNT OF CRUDE RUBBER IMPORTED BY customs districts into Los Angeles and Massachusetts it is interesting to note that during the first seven months of 1923 Massachusetts imported 12,434,596 pounds, as compared with the total for this period taken by Los Angeles of only 7,054,521 pounds. In the corresponding months of the year previous, however, Los Angeles had led, at 5,618,564 pounds, with Massachusetts standing at only 3,314,642 pounds.

What the Rubber Chemists Are Doing

Measuring Cure by Compression Tests[1]

THE following test was devised to supplement tensile tests on compounds which have flat time-tensile curves and which are used in large masses, as in solid tires and rubber blocks, or in masses too small to furnish tensile test prices.

One-inch cubes cut from the rubber mass were buffed smooth and trued up to an accuracy of ± .005 inches in an Emerson buffing machine with a special slide for holding the cube.

An attachment, shown in Figure 1, was made for the Scott testing machine, consisting of three steel plates, two of which are held rigid with the third, a moving member between the two rigid plates, held in place by freely moving guides. This is so arranged that the rigid members are attached to the worm screw

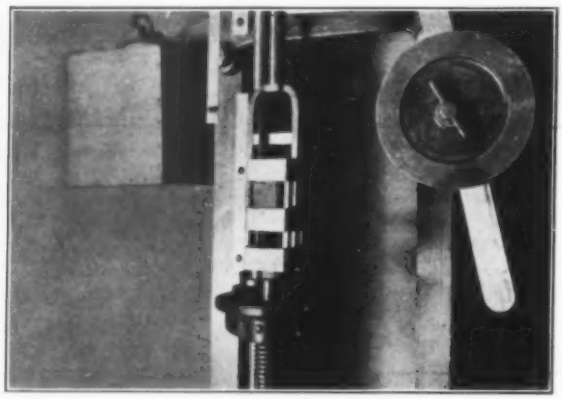


Fig. 1—Compression Test Attachment for Scott Machine

of the Scott machine while the moving member is attached to the dial arm using an extension rod with a right and left hand thread. By placing the cube between the moving plate and top plate of the rigid member, it may be compressed in the same manner as the tensile test piece is stretched.

The Scott machine was so altered by changing the gears that it could be reversed by the automatic clutch and return at the same rate of speed. The speed used in all compression tests was at a rate of two inches per minute.

Readings were taken at every five hundredths of an inch compression up to 200 pounds load. The compression was read at 200 pounds load, the machine reversed, and readings again taken on the return. These readings were taken by means of a scale attached to the rigid members. The scale is divided into hundredths of an inch and readings were taken with the aid of a magnifying glass.

Compression in per cent under 200 pounds load was read directly when the machine was reversed. Areas of energy input and output were figured, using the method of J. R. Sheppard[2], thus obtaining total energy input, hysteresis loss, and energy loss. As a measure of stiffness the load at fifteen per cent compression may be taken.

The data for time tensile curves of a typical stock which is rather flat is shown in Table 1 and Figure 2.

TABLE 1

Cure, minutes, at 292° F.	75	90	105	120	135	150	165	180
Tensile	2,351	2,345	2,392	2,315	2,367	2,304	2,337	2,142
Elongation	6.0	6.2	6.1	5.9	6.0	5.8	5.8	5.6
Set	1.38	1.37	1.43	1.44	1.41	1.42	1.43	1.39
Hardness	57	58	61	62	60	62	62	62
Abrasion	3.28	3.22	2.65	2.76	2.88	3.67	3.22	2.71
Slope	47	51	54	56	56	54	53	56

These are more or less skin cures, the slabs being ⅛-inch in thickness. The correct cure appears to be about 90 minutes. From the same stock from which these slabs were cured, blocks 1½ by 1½ by 4 inches were cured in straight cures. The test data obtained showed the same tendency toward a flat curve.

Compression data applied to masses 5 by 5 by 3½ inches indicated considerable variation according to the original position of the cube in the stock. This showed that the compression probably indicates the physical state of the rubber.

Application of Compression Tests

This test has been applied for regulating the cure of blocks too small to furnish tensile test pieces. By using a larger machine this test has been adapted for compressing the entire block, allowing inspection to be made without injuring the block.

In order to correlate compression curves with tension curves, the tensile stress-strain curves are plotted according to the method of E. Hatschek,[3] the load being calculated upon the actual area. The equation formulated by J. W. Shields[4] for the corrected stress-strain curve may be applied by assuming the change in area under compression to be proportional in the same manner as under tension.

A typical set of points obtained on tension and compression stress strain curves are shown in Table 2, with corresponding values obtained from Shields' formula.

TABLE 2

Per Cent Elongation	Observed Tensile Pounds	Calculated Tensile Pounds	Per Cent Compression	Observed Load, Pounds	Calculated Load, Pounds
100	€50	650	50	43	42
200	2,100	2,100	10	81	81
300	5,000	4,850	15	113	114
400	9,750	9,525	20	143	142
500	15,950	16,075	22½	155	154

Both curves were run at a speed of two inches per minute.

As yet, all attempts to produce a smooth curve by plotting tensile and compression curves on the same scale in the first and third quadrants have failed. The slope of the two curves at zero elongation in all cases has been of different magnitude.

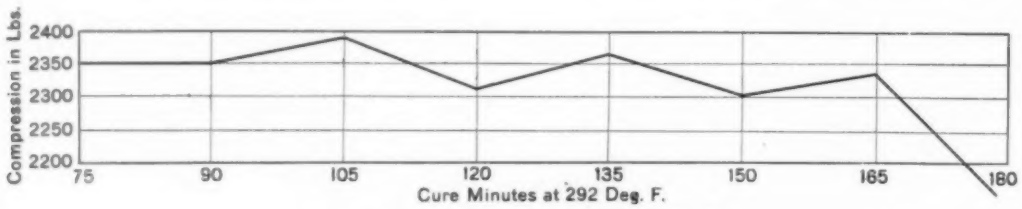


Fig. 2—Compression Curve of Typical Stock

[1] Presented before the Rubber Division at the meeting of the American Chemical Society, New Haven, Connecticut, April 2 to 9, 1923.

[2] THE INDIA RUBBER WORLD, October 1, 1921, p. 29.

[3] *Journal of the Society of Chemical Industry*, 40, 252 T.

[4] *Rubber Age*, New York, 10, 88.

Benzol Poisoning[1]

Benzol is a pure hydrocarbon obtained from the distillation of coal tar and from the strippings of coke-oven gas. It was not much used before 1910, but production, expanded to meet war needs, has now made it readily available and comparatively cheap. It is an excellent solvent for organic material.

Except where it is used in the manufacture of chemicals and explosives, burned as motor fuel, in illuminating gas, or in welding, benzol is used chiefly as a solvent—mainly as a rubber solvent for cementing in the manufacture of rubber goods, tires, hose, footwear, garments, gloves and in the sealing of cans. It is used in the making of artificial leather, linoleum and straw hats. It is used in painting, either in tar paints, or as a "thinner" or varnish remover. It is used as a solvent for cement in can making, in shoe manufacture, in extracting fat from bones, and in dry-cleaning processes.

Besides pure benzol and toluol and xylol, there are several kinds of commercial benzols, these containing toluol, xylol, thiophene, and rarely, traces of carbon disulphide.

The usual commercial products are:

PURE BENZOL. A clear, colorless liquid of characteristic odor. Boiling point 79.7 degrees C.

NINETY PER CENT BENZOL. So called because in the distillation 90 per cent distills over at a temperature less than 100 degrees C. It is composed of 80-85 per cent benzol, 13-15 per cent toluol, 2-3 per cent xylol, and sometimes contains as impurities traces of olefins, paraffins, sulphuretted hydrogen, and other bodies.

FIFTY PER CENT BENZOL. This substance contains 50 per cent of constituents which distill below 100 degrees C., and 90 per cent below 120 degrees C.; it is a very mixed product, with only 40 to 50 per cent benzol.

SOLVENT NAPHTHA. This material is called solvent naphtha because it is used extensively (especially in England) for dissolving rubber. It is relatively free from benzol, and consists largely of xylol.

It seems generally accepted that pure benzol is more poisonous than the other grades referred to.

A great variation in individual susceptibility appears to be well established. Women and children, as well as individuals of deficient eliminative powers are affected more easily. Atmospheric conditions of temperature and humidity seem to affect greatly susceptibility.

Entrance of benzol into the body occurs chiefly through the lungs. Eighty per cent of inspired benzol is absorbed by the body, less than one-half of which is recovered in six hours. Skin absorption is slight. Given by mouth in the treatment of certain blood conditions, doses up to three grams a day have been tolerated for a considerable period. (As a remedy it is at present little used.) It is excreted through the lungs, or as phenols in the urine.

The action of benzol is anesthetic on the nervous system, and destructive of blood and fat. Doses as small as 0.02 to 0.05 parts of pure benzol per 1,000 parts of air in animals affect the cardiorespiratory nervous centers and produce delirium and death. Small doses long continued affect the nervous system, the blood and blood-forming organs. The white cells, especially those formed in the bone marrow, are destroyed. Platelets disappear. Coagulation and viscosity are effected. Immune bodies and antibody production are depressed. Red cells are destroyed. Recovery is slow.

Post-mortem pathology in acute cases show cyanosis, fluid blood, minute hemorrhages from skin and mucous membranes, and the presence of benzol in brain and tissues. In chronic cases the picture is that of non-regenerative anemia with purpuric spots and hemorrhages, and fatty degeneration of the bone marrow and organs.

Symptoms of acute poisoning are: faintness, dizziness, breathlessness, rapid pulse, cyanosis or lividity, and sudden death, preceded at times by acute mania or delirium.

Symptoms of chronic poisoning are: gastro-intestinal symptoms, anemia, reduction of white cell count, especially the polymorphonuclears; reduction in red cells with increase in coagulating time of blood; neurasthenia; hemorrhages from various mucous membranes; purpuric spots on the skin. Local action sometimes produces irritation and dermatitis. Numbness, pallor, parasthesia of exposed fingers is common.

The diagnosis of benzol poisoning is made by history of exposure, plus gastro-intestinal symptoms, anemia, hemorrhages, purpura, increase in coagulating time of blood, reduction in both red and white blood cells. The reduction in numbers of white cells is especially characteristic of benzol poisoning.

Treatment for acute poisoning is immediate, absolute rest and absence of any effort; fresh air or oxygen; prolonged convalescence.

Chronic cases of poisoning, if mild, recover on removal from exposure with treatment of fresh air and iron tonics. Cases with purpura or hemorrhages require repeated transfusions and blood-building food and tonics.

Tentative Recommendations

Meanwhile the committee recommends the following precautionary measures as a means of preventing poisoning by benzol in processes where this material constitutes a hazard:

1. The use, where possible, of enclosed apparatus for the handling of benzol.

2. The use of special exhaust ventilation where employes are exposed to the fumes of benzol: (a) where benzol is evaporated at room temperatures, air removal by general room ventilation with down draft is recommended, although in certain enclosed processes where negative pressure can be applied, direct ventilation (from the enclosure) with upward draft may be indicated; (b) where localized heat is applied in the evaporation of the benzol, hoods or enclosures should be provided with up-draft. This draft should be sufficiently intensive and applied so closely to the point of origin of the evaporating benzol to insure the complete removal of all of the benzol before the heated surface is removed from the hood or enclosure. This recommendation deals with specific processes where sufficient upward air movement is created by the heated surface to overcome the natural density of the benzol vapor.

3. The use of special exhaust ventilation for tank cars and other containers together with the use of special protective breathing apparatus in the cleaning of tanks and other enclosed spaces where benzol may constitute a hazard. The committee does not recommend the use of ordinary commercial respirators as a means of preventing the absorption of benzol fumes.

4. Physical examination of all new employes with the object of excluding from benzol processes applicants suffering from: (a) organic diseases of heart, lungs or kidneys; (b) hemorrhagic tendencies; (c) anemia or any unusual blood picture.

5. Frequent re-examinations of all employes exposed to benzol and the temporary exclusion from benzol processes when examination reveals the presence of: (a) hemorrhages from the mucous membranes of the nose, mouth or other organs.

Appended to the report is an exhaustive bibliographical review of the subject of benzol poisoning prepared by Dr. J. W. S. Brady, a member of the committee.

[1] Progress Report of Committee on Benzol Poisoning read before the Chemical Section, National Safety Council, at the Twelfth Annual Safety Congress, Buffalo, New York, October 1 to 5, 1923.

B. R. T. REFINED TAR

In certain branches of rubber work, as, for example, footwear, automobile topping, etc., tar is a desirable ingredient for its softening and other effects. For this need there is a refined tar known as B. R. T. which has advantages over the use of common tar not specially prepared for rubber work.

Chemical Patents

The United States

METALLIC COATING ON VULCANITE. Process of coating a body of vulcanite with metal, which comprises softening the surface of the body by chemical means and causing a precipitation of a metal upon and below the softened surface.—John A. Daly, New Rochelle, N. Y., assignor to Gold Sealed Denture Process Co., Inc., New York, N. Y. United States patent No. 1,472,244.

RUBBER COMPOSITION AND METHOD. A process and product of vulcanizing rubber in the presence of sulphur and a reaction product of ammonia or an aliphatic amine, an aliphatic ketone, a dehydrating agent, and one of the five reactive compounds of sulphur named in the specification.—Harry L. Fisher, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,473,285.

PLASTIC MATERIAL. A plastic material consisting of a fiber pulp, shredded rubberized fabric, an emulsified oleaginous substance and sulphur.—Frank T. Lahey, Akron, Ohio. United States patent No. 1,474,482.

The United Kingdom

PLASTIC WATERPROOF COMPOSITION. Plastic compositions are produced by mixing powdered slate and sodium silicate solution to form a slurry, which is thickened by further additions of slate until the mass loses its plastic character but is capable of consolidation by pressure. Waterproofing agents such as resin, paraffin, wax, gums, rubber, and vulcanite may be added. The product is molded into bricks, blocks, statues, ornaments, etc., either hot or cold at a pressure of one ton to the square inch.—T. Gare, 25 Victoria street, Westminster. British patent No. 202,737.

VULCANIZATION ACCELERATOR. Butyraldehyde-ammonia is employed as an accelerator of vulcanization. It is prepared either by dehydrating the reaction product of butyric aldehyde and aqueous ammonia, or by treating butyric aldehyde with gaseous ammonia.—Société Ricard Allenet et Cie, Melle, Deux-Sevres, France. British patent No. 204,052.

The Dominion of Canada

FRICTION COMPOSITION. The process of making a brake friction member which comprises impregnating asbestos with a condensation product of phenol and methylene-diphenyldiamine and heating gradually to about 350 degrees C.—William Achtmeyer, Middletown, Connecticut. Canadian patent No. 235,514.

Germany

Patents Issued with Dates of Issue

384,703 (August 11, 1918). Method for regenerating old rubber. Addition to Patent No. 382,989. Konstantin Georgi, Zehlendorf, Wannseebahn.

384,806 (January 14, 1917). Method of making waterproof elastic substances. Diamond State Fibre Co., Bridgeport, Pennsylvania, America; represented by C. Fehlert, G. Loubier, F. Harmsen and E. Meissner, Berlin S. W. 61.

CRAYONS FOR RAW STOCKS

Marking batches of raw stock in the rubber plant is extremely important as a means of identification to avoid serious loss and errors. The careless practice of using common chalk crayons for this purpose always proves unsatisfactory and should be abandoned in favor of colored wax crayons. These are inexpensive and purposely made of such melting point that they readily give a clear mark on warm compounds. Their colors are red, yellow, blue, and black, permitting selection of contrast for distinct marking on any colored stocks. The marks are permanently legible and are not obliterated by handling or brushing away of dust.

ACCELERATORS IN "SOLID SOLUTION" [1]

It is possible to change the high melting point of any desired organic body to a lower one, and also to change the nitrogen content of the resultant body in the same way, according to the body or bodies that are combined in it. These must be miscible with each other, and if suitable percentages of each are employed any melting point required may be obtained within a comparatively wide range.

An illustration of a "solid solution" of two such organic bodies thus modified is as follows:

31 parts diphenylguanidine, M. P., 147 degrees C.; 65 parts tetraphenylmelamine, M. P., 173 degrees C., yielding 96 parts new accelerating body, M. P., 140 degrees C.

The same materials in the proportion of 31 and 39 parts, respectively, yield 70 parts new accelerating body, M. P., 120 degrees C. In both instances the nitrogen content of the product is 19.9 per cent.

One or more such substances as mentioned are characterized by high nitrogen content; non-toxic to lungs and skin; non-hygroscopic; free from objectionable odor; and one which when combined with a body of a suitable lower melting point and miscible with it gives a product with a common melting point as might be most desired. This permits utilizing those products high in nitrogen content of melting points so high as to have prevented their recognition heretofore as valuable accelerators in curing rubber.

[1] United States patent No. 1,465,743. George H. Stevens and Corl H. Eaton.

VERCAZOL [1]

Vercazol is the commercial name of a vulcanization accelerator chemically known as furfuramide. It has in high degree the valuable property of improving considerably the conditions of vulcanization and the qualities of the vulcanized rubber. When added to the extent of 0.5 to 2 per cent of the weight of the rubber in the mixture to be vulcanized it diminishes the vulcanizing time 70 to 80 per cent and the temperature of heating by 8 to 10 degrees C. It increases the elasticity, the nervous quality and the resistance to breaking of the vulcanized rubber by 100 to 150 per cent. It has been found that all nitrogen derivatives of the furfuryl group act in like manner to furfuramide and have similar accelerating and vitalizing properties.

[1] U. S. Patent 1,440,176. Eloi Ricard, assignor to Société Ricard, Allenet & Cie., both of Melle, Deux-Sèvres, France.

"FIXANAL" FOR NORMAL SOLUTIONS

Under the designation "Fixanal" equivalents of certain substances are put up in sealed tubes for the preparation of tenth normal solutions. The list of materials includes 13 of the more common reagents and the list is to be extended. Fixanal preparations come in small tubes of resistance glass in the form of concentrated solutions in so far as they are not solid under ordinary conditions. A tenth normal is obtained by dissolving the contents of a fixanal tube in one liter. If another concentration is desired the contents are diluted or dissolved in a larger or smaller volume, or, in case of more concentrated solutions, the contents of several tubes may be dissolved in one liter.

FRICTION STOCK SOFTENER, RESIN C

Softness and tackiness desirable in all stocks for friction purposes are indispensable in stocks for friction tapes. A new coal tar product used largely in tape manufacture is that known as Resin C. As a rubber softener it is adapted for many types of rubber stock other than friction when used with discretion.

The Editor's Book Table

Book Reviews

"ELASTIC AND NON-ELASTIC NARROW FABRICS." BY SAMUEL Brown. Bragdon, Lord & Nagle Co., 334 Fourth Avenue, New York, N. Y. Paper, illustrated, 75 pages, 6 by 9 inches.

THIS book, which originally appeared serially in *Textile World*, is republished in its present form at the urgent request of many readers. The idea of elastic web weaving was first conceived about 1840 and its manufacture dates from about 1860, looms imported from England being used, some of which are still in operation along other lines.

The successive chapters of this book deal in an authoritative way with the details of plain and fancy looms, handling rubber warps, and the production of many fancy effects in woven elastic fabrics, the harness drafts of which are given in connection with illustrations of the various finished webs. Particular mention is made of the care to be exercised in finishing on account of the sensitive rubber element, which in every stage of the weaving requires expert handling.

One of the latest developments in weaving narrow fabrics—the making of men's collars with long-sided effect and folding line—is described. Knitted narrow fabrics are treated in a supplementary chapter by William Davis.

"VOLUME INCREASE OF COMPOUNDED RUBBER UNDER Strain." By Henry Green. The New Jersey Zinc Co., New York, N. Y. Paper, illustrated, 10 pages, 6 by 9 inches.

This paper originally presented before the Division of Rubber Chemistry of the American Chemical Society, Rochester, N. Y., April 26 to 29, 1921, is reprinted as a bulletin of the Research Laboratory of The New Jersey Zinc Co. for distribution to those interested. The author is well known for his contributions in the fields of paint and rubber technology through his investigations as a microscopist. The effects of the volume increase of rubber under strain are shown by microphotography, experimental details are recorded, and a brief theoretical mathematical discussion is given.

An abstract of this paper will be found in THE INDIA RUBBER WORLD, June 1, 1921, 658.

"A. S. T. M. TENTATIVE STANDARDS, 1923." PUBLISHED BY the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pennsylvania. Paper or cloth, illustrated, 6 by 9 inches.

This annual includes specifications and methods of testing for 15 classes of engineering materials. The term "Tentative Standard" as distinguished from "Standard" is applied to a proposed standard which is printed for one or more years with a view of eliciting criticism before final action toward the adoption of the tentative standard by formal action of the society.

The present volume contains nine tentative specifications relating to rubber products, hose for various purposes, belting for power transmission, matting for use around electrical apparatus, insulated wire, cables, and insulating tape for electrical purposes. Complete details of procedure for the chemical and physical testing of vulcanized rubber are given for testing various rubber products.

The section on Textile Materials is important to the rubber industry by reason of the following topics treated: Specifications for Textile Testing Machines; Imperfections and Tolerances for Square-Woven Tire Fabrics; Imperfections and Tolerances for Cord Tire Fabrics; Tolerances and Test Methods for Cotton Yarns and Cords; Tolerances for Hose Ducks and Belt Ducks; Methods of Testing Cotton Fibers; and Definition of Terms Relating to Textile Materials.

The volume is distributed to members of the society and is available to others by purchase.

"RUBBER AND GUTTA PERCHA INJECTIONS—SUBCUTANEOUS Injections of Rubber and Gutta Percha for Raising the Depressed Nasal Bridge and Altering External Contours." By Charles Conrad Miller, M.D. Published by the Oak Printing & Publishing Co., Chicago, Illinois. Cloth, illustrated, 99 pages, 5½ by 8 inches.

In an introduction to this little volume the author states as his opinion that vulcanized rubbers will not prove as satisfactory for use in the surgical processes in question as crude rubber or gutta percha, the various chemicals used in curing rubber making the product more uncertain. He also states at the close of the book that the methods set forth therein are not as yet recognized as established surgical procedures. Some interesting facts are, however, included in such chapters as: "Commercial Rubbers in Surgery"; "Rubber and Gutta Percha Subcutaneously"; and, "Methods of Preparation of Gutta Percha for Injection Subcutaneously." A chapter entitled "Gutta Percha—Source and Characteristics," contains a long quotation from "Crude Rubber and Compounding Ingredients" by Henry C. Pearson, editor of THE INDIA RUBBER WORLD.

"A HANDBOOK ON THE CREPE RUBBER SOLE." ISSUED BY The Propaganda Department of the Rubber Growers' Association, Inc., 2, 3 and 4 Idol Lane, Eastcheap, London, E. C. 3, England. Paper, illustrated, 23 pages, 6 by 9 inches.

This little volume recounts the origin and sums up the various properties of natural plantation-finished crêpe rubber soles. It tells how they are made and used on sport shoes and outlines their further prospective applications for everyday wear. Methods of attachment are described and detailed instructions given for both the single and double sole process. The handbook is of timely usefulness in view of the increasing popularity of crêpe soles in North and South America, Europe and the Far East where the idea originated.

New Trade Publications

"CUMAR, A COAL TAR RESIN," IS THE TITLE OF A BOOKLET CONcerning the composition, properties, and uses of Cumar resin. This material is of various melting points, giving it a wide application in various industries such as paint, varnishes and lacquers, printing inks, rubber and electrical insulation. Cumar mills readily into rubber and gives the compound a desirable tackiness. The softer grades can also be used as an aid to securing smoothly running stocks in tube machine work. Its light color permits its use in light colored stocks. Cumar may be used in reclaimed rubber, gutta percha stocks, and in the manufacture of cements.

A WELL-ILLUSTRATED BULLETIN, ENTITLED "WESTINGHOUSE Underfeed Stoker," represents clearly the leading features of a new model design, as produced by the Westinghouse Electric & Manufacturing Co., Stoker Department, South Philadelphia Works, Philadelphia, Pennsylvania. This particular mechanism, built in all sizes and types to meet specifications for industrial requirements, represents the results attained by the Westinghouse organization after thirty-five years' experience in the design and manufacture of combustion equipment.

A NEW ILLUSTRATED CATALOG REPRESENTING VARIOUS STYLES OF men's rubber clothing has been recently issued by the Chicago Rubber Clothing Co., Racine, Wisconsin. This company, organized in 1882, also manufactures a line of raincoats for women and children, as well as producing rubber sheetings, blankets, and rubber coated fabrics for the trade.

A LITTLE PUBLICATION ISSUED UNDER THE TITLE "FACTS," AND sent out by The Cleveland Liner & Manufacturing Co., Cleveland, Ohio, describes the preparation and uses of the company's "Blue Processed Liners," which are especially adapted to the handling of all coated and frictioned stock, gum stocks, separators for all batch stocks, etc. Having been treated with a chemical solution, these processed liners facilitate the separation of stock and liners, and are said to benefit the stocks and outwear several plain liners.

A WELL ILLUSTRATED LITTLE CIRCULAR, ISSUED BY THE DAYTON Rubber Manufacturing Co., Dayton, Ohio, and entitled "The Making of a Thorobred," is deserving of attention as an example of attractive and clever advertising. The company's products, "Thorobred" cord tires and tubes, are said to have stood the test of hard service, and represent the result of careful study and experiment.

TWO ILLUSTRATED CATALOGS ENTITLED "JONES PULLEYS" AND "The Lemley Friction Clutch" are being published by the W. A. Jones Foundry & Machine Co., 4401-4451 West Roosevelt Road, Chicago, Illinois. Many tables of specifications are included in these publications, while photographs representing the exterior and interior of the plant form an interesting feature.

AN ILLUSTRATED CATALOG, ENTITLED "AMERICAN SPRING POP Safety and Relief Valves for Stationary, Portable and Marine Use," is descriptive of the many types of valves offered by the American Schaeffer & Budenberg Corporation, Brooklyn, New York. All valves manufactured by this company are guaranteed for perfection of materials and workmanship and for satisfactory operation when properly installed. All such equipment has also been so constructed as to conform to the requirements of the A. S. M. E. and various other boiler codes.

Recent Articles Relating to Rubber

Fabric Stresses in Pneumatic Tires. A mathematical analysis of fabric stresses in pneumatic tire carcasses in the field of tire design. The stresses discussed are: Static (1) stresses due to inflation pressure; (2) stresses due to deflection under load. Dynamic: (3) traction and braking stresses; (4) centrifugal stresses. H. F. Schippel. *Industrial and Engineering Chemistry,* November, 1923, 1121-1131.

The Absorption of War Gases by Rubber and Rubberized Fabric. Reported results of experiments, unique methods employed and their possible utilization in other fields than gas mask development. Rubber and rubberized cloth are very efficient in removing small quantities of war gases from air and the rate of absorption is rapid enough to account for the fact that men are not gassed in the Tissot type masks even when these masks allow several hundred cubic centimeters of gas-laden air per minute to leak in.—Thomas M. Rector. *Industrial and Engineering Chemistry,* November, 1923, 1132-1133).

Effect of Age on Synthetic Resin Molded Products of the Phenol-Formaldehyde Group. Author's conclusion: "Specific data on aging are hard to interpret because of the dependence of the values upon so many variable factors, such as proportion of filler and paper, kind of paper, etc. I do feel justified, however, in presenting the conclusion that these resinous bodies do improve in electrical properties during aging, and other changes that occur are slight and of little significance."—E. J. Casselman. *Chemical Age,* October, 1923, 443-5.

Latex Paper-Aging Tests. Report of an investigation with the object of ascertaining whether latex treated paper will stand the test of time and prove suitable for books and records which have to be kept permanently. Test samples of papers plain and latex treated were placed in an air oven heated at 700 degrees C. and one sheet of each, or four in all, were removed after the following aging periods: 1, 3, 5, 8, 14 and 21 days. After the period of aging the samples were put aside for two or three weeks and then subjected to bursting strain tests. The results indicate that in some respects the latex does not influence the aging qualities of the paper, and in others the influence is beneficial.—H. P. Stevens. *Bulletin of the Rubber Growers' Association,* October, 1923, 558-9.

Sprayed Rubber—Fourth Communication. The vulcanizing properties of sprayed rubber after the elimination of the water soluble constituents showed improvement indicated by higher tensile figures obtained. Sprayed rubber which gave figures commonly obtained with ordinary plantation, yields, after water extraction, a rubber giving normal figures. The process of water extraction had no appreciable effect on the rate of cure, which remains about two-thirds faster than normal plantation rubber.—H. P. Stevens. *Bulletin of the Rubber Growers' Association,* October, 1923, 560-1.

The Effect of Opening New Cuts on the Properties of the Rubber Produced. The present system of alternate resting and tapping periods usually of four months' duration has led to an inquiry as to the effect produced on the properties of rubber. The result of tests make it apparent that the rubber from trees first brought into tapping vulcanizes more slowly than that from trees in regular tapping and that the longer the tapping proceeds the nearer the rate of vulcanization approaches to normal. After five weeks tapping, the rubber vulcanizes almost as fast as the control consisting of sheets made from ordinary bulked latex.—H. P. Stevens. *Bulletin of the Rubber Growers' Association,* October, 1923, 561-2.

Formation of Diphenyl-dithiocarbamate of Zinc. (French). Chemical constitution, analytic research, and industrial products. Zinc dithiocarbamate as an accelerator.—Jean Garach. *Le Caoutchouc et la Gutta Percha,* October 15, 1913, 11946-49.

The Action of Oxidation Inhibitors on Rubber (French). Mouren and Dufrasse have shown that traces of phenols inhibit the oxidation of organic compounds by oxygen and have cited rubber as a substance which can be protected from oxidation by such catalysts. Examples of their effect are given and the conclusion stated that such anti-oxidases can be used in practice to prevent the deterioration of crude and vulcanized rubber and to increase the quality of air cured rubber.—André Helbronner and Gustave Bernstein. *Comptes Rendes,* 177, 204-6 (1923).

Mechanism of the Action of Aniline and Its Homologs as Accelerators of Vulcanization—I. T. Kimishima.—*Journal of Chemical Industry of Japan,* 25, 1141-53, 1922.

A Review of the Vulcanization Process from Its Inception to the Present Day. In this paper, which was read before the Birmingham Section of the Institution of the Rubber Industry, London, England, October 26, 1923, the author gives a very interesting account of the results of the labors of Goodyear, Hancock, and early Dutch and German experimenters in their attempts to manufacture serviceable rubber goods. The various methods of vulcanization are discussed, including the most recently perfected method of curing with agents other than sulphur. The paper is followed by an interesting discussion and reply by the author, B. W. D. Luff, *The India Rubber Journal,* November 10, 1923, 725-733.

Artificial Rubber Latices. (Italian.) Successful attempts to prepare emulsions of rubber in water (artificial latex) are described. This was accomplished in principle by preparing a rubber solution containing water as the disperse phase and inverting such system to a dispersion of the rubber solution in water. The phenomena were studied by coloring the water phase with an indicator and microscopically. Rubber recovered from such emulsions showed the same vulcanizing properties that it had previous to emulsion. A bibliography is included.—Camillo Pelizzola, *Giornale di Chimica Industriale ed Applicata* 5, 76-7, 1923.

Influence of Periodical Tapping on the Properties of Rubber. —Dr. O. de Vries. (Dutch.) *Nederlandisch Indisch Rubber-en-Thee Tijdschrift,* Weltevreden, Java, October 1, 1923, 443.

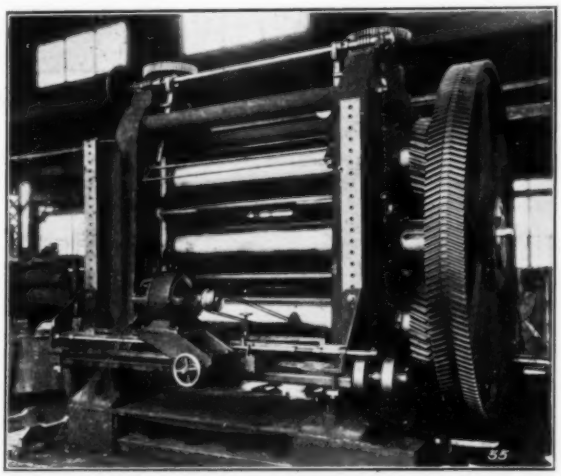
New Machines and Appliances

Portable Roll Grinder

PROBABLY no rubber mill today resorts to the expedient of shipping calender rolls back to the maker for regrinding, because of the great loss of time and expense involved. Equally accurate work can be done more economically by the use of the portable roll grinder which is here shown attached to a calender frame and in process of grinding the bottom roll.

The undertaking of truing a calender roll is admittedly a difficult one. Speed, accuracy, and smoothness of operation are the essential requirements for any device for this purpose. These are possessed in marked degree by the roll grinder here shown at work on a 66-inch roll calender.

This grinder is motor driven by direct current and has a mechanical adjustment for grinding any desired curvature on the roll with a true crown. The design is such that the grinding wheel can travel the full length of the roll without resetting and the grinding motor has a special mounting to reduce vibration to a minimum, thus insuring speed and allowing a good finish.



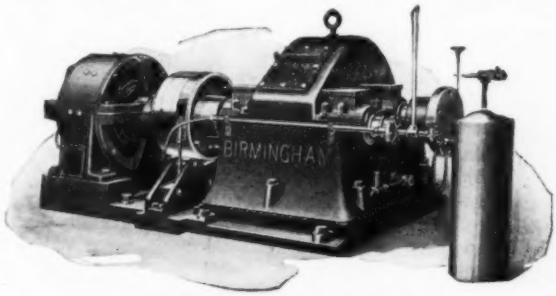
Vaughn Portable Roll Grinder

With this grinder it is possible to true a roll within limits of two ten-thousandths of an inch and attachments are provided to permit its use on any make of calender. —The Vaughn Machinery Co., Cuyahoga Falls, Ohio.

Herringbone Gear Reduction Drives

A well designed and substantially built enclosed herringbone gear reduction drive is here illustrated with pneumatic cut-off clutch and safety brake and motor, all mounted on a single bed plate. These drives are built in a number of sizes, from 35 to 1,000 horsepower. Every feature of the housing and gear case lends to great rigidity and compactness.

The proportions of the gears are such that a maximum number of teeth are in contact, while the drive occupies a minimum amount of floor space. The gears are of cast steel of higher carbon than is commonly used. In cases of large reduction a special heat treated nickel chrome steel is used. The form of tooth is such that maximum strength and smoothness of action are secured. The smoothness of operation of these drives makes it possible to use high speed motors, reducing the cost of both motor and drive necessary to transmit a given power. A stock drive has been run as a shop test by the builders at a peripheral speed of 4,400 feet per minute with perfect smoothness and absence of vibration and noise. In addition to the usual factors of safety these drives, up to the larger sizes, have 50 per cent overload capacity and 100 per cent stock overload beyond their



Birmingham Reduction Drive

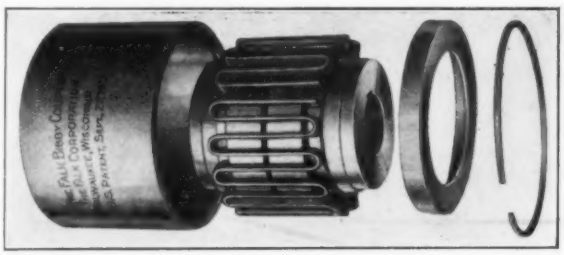
normal ratings. The larger sizes have 75 per cent working overload for continuous running and 150 per cent shock overload.

In these drives the lubricating system is designed to absolutely prevent any oil from leaking outside the case or bearings. The same oil is used for both gears and bearings. It is splashed by the gears into the cover where it is caught by grooves and distributed to reservoirs over each bearing. Pipes lead the oil from these reservoirs to the bushings flooding the shafts with oil continuously.—Birmingham Iron Foundry, Derby, Connecticut.

Flexible Coupling for Power Transmission

Flexible couplings are very essential equipment especially on long shafts performing heavy duty, a condition of common occurrence in rubber plants as well as in many others where heavy machinery is connected on the same line shaft.

A very unique and effective flexible coupling is that here pictured with parts separated to show its construction. The coupling consists of two flanged steel disks, one of which is keyed to each shaft, a tempered steel spring in segments forming a continuous cylindrical grid, and a shell. On the outside of the flanges are pitched cross grooves in which the spring is placed. The spring is the flexible member and its shape and that of the grooves are the characteristic feature of the coupling, and allow for flexibility commensurate to the load being transmitted. Under extreme overloads, the springs are supported at



Falk-Bibby Flexible Coupling with Shell Removed

their inner ends and are then in shear, and capable of resisting many times the load.

Freedom from wear and unusual overload capacity, are claimed for the coupling. The working parts are inclosed in the floating shell which provides space for the packing of lubricant.—The Falk-Bibby Corporation, Milwaukee, Wisconsin.

Flexo Pipe Joints

The numerous flexible and swing joints required to make connections of air, water, and steam in mill, calender, and press rooms of rubber plants result in causing much annoyance and loss if not kept tight. One of the simplest and most effective devices for such connections is the Flexo joint, the parts of which are shown in the illustration. It represents a radical departure in flexible and swing joint construction, is not dependent on packing springs or ground parts.

Parts of Flexo Kant Leak Pipe Joint

The joint comprises only four simple parts, and is made in four styles so that maximum flexibility may be obtained for any given use at minimum cost. They are quickly and easily installed, require no attention, and their patented design insures a full port at any angle, which means unimpeded flow at all times. Constructed of steam brass these joints are adapted for use with air, oil, water, or steam.—Flexo Supply Co., St. Louis, Missouri.

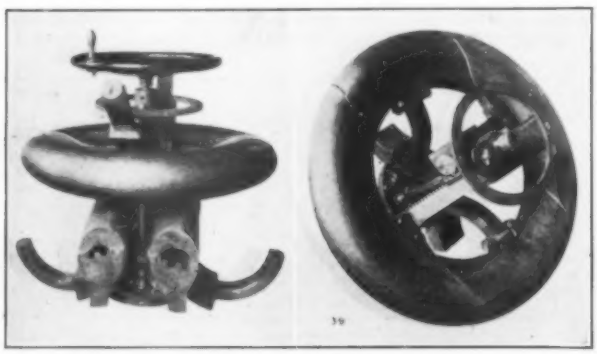
Giant Automatic Chuck

The latest type of core chuck here illustrated and known as the "Giant Automatic" has been developed to meet the demand for a quick acting core along the lines of the well-known automatic chuck, and is suitable for the manufacture of truck size tires as well as for the new "balloon" or "super-cushion" tires. This chuck reduces to a minimum the number of cores required and saves the handling of heavy cores, thus eliminating the danger and labor of hand stripping, which are most important items in large tire building.

The method of operation is most ingenious, the key sections being controlled by circular racks and the other sections by straight racks, all being operated from one hand wheel. The time required for the complete cycle of operations is but little more than for the "Automatic" type.

It is built only in the size shown and cores for any of the following size tires may be mounted on the chuck in a very few minutes: 32 by 6, 36 by 6, 34 by 7 and 38 by 7 truck tires; 32 by 6 and 34 by 7 super-cushion tires and 6:20 and 7:30 balloon tires.

While the chuck was primarily designed for use on a machine, it may also be used for hand building. The "Automatic Junior,"



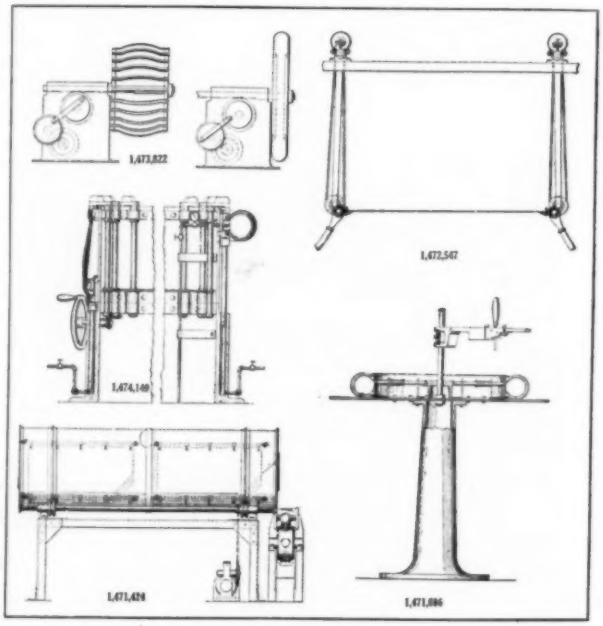
COLLAPSED FOR STRIPPING READY FOR BUILDING

DeMattia Giant Automatic Chuck

which has been on the market for some time, will accommodate 27 by 3½, 28 by 4, 29 by 4½, 30 by 5 and 32 by 5, also the 4:40 and 5:25 balloon tires. As the automatic accommodates a complete range from 30 by 3 to 37 by 5, the addition of the "Giant Automatic" makes it possible to accommodate cores for all sizes and types of pneumatic tires up to and including 7 inches, on only three different sizes of chucks.—De Mattia Bros., Garfield, New Jersey.

Machinery Patents

BALL VARNISHING MACHINE. The requisite amount of coating material is smoothly and evenly applied to play balls rapidly and economically by this machine. This is accomplished continuously by utilizing a revolving drum into which balls are fed at one end and discharged at the other through annularly arranged horseshoe-shaped openings. Distribution of the coating material upon the balls is effected by longitudinally arranged brushing curtains and crosswise portions with ports to regulate the speed of passage of the balls through the drum. Varnished balls are received and dried on a system of conveyor belting arranged to support the balls



on equilaterally spaced points to prevent injury to the varnished surface.—Charles W. Steele, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,471,424.

TIRE CUTTING IMPLEMENT. This is a hand-operated device mounted on a table. It centers about a system of four cam-operated spring bolts for holding securely and centrally in the machine a tire casing to be operated upon. By means of adjustable cutters the tire beads can be cut away from the casing, or the side wall rubber can be cut away from the carcass without injury to the fabric by swinging the tool holding lever around the circle.—Francis J. Curtis, Sharon, Pennsylvania. United States patent No. 1,471,686.

SELVAGE-EDGE CUTTING MACHINE.—This machine is designed for trimming the selvage edges from fabrics such as the friction fabric used in the manufacture of pneumatic tires. The removed material is in comminuted form so as to be in condition to be utilized in the manufacture of various articles such as composition soles, heels, etc. The machine consists essentially of two motor driven pendulums suspended, convex toothed wheels each cooperating with a fixed knife. This mechanism is adjustable to the fabric edges which it serves to trim in comminuted condition by a succession of bites. The cutting members are enclosed in chambers through ports in which the trimmed material is dis-

charged.—James W. Brundage, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,472,547.

DEVICE FOR EXPANDING ENDLESS BANDS. The expansion of endless tire bands in such manner that the central portion of the band receives a uniformly greater stretch than the edge portions is accomplished by means of an expansible and contractable former comprising several flexible bar members pivotally connected at their ends to opposite heads which are caused to move toward each other, thus giving the flexible bars an outward bend which expands the band to tire form.—G. H. Lewis, assignor to The Fisk Rubber Co., both of Chicopee Falls, Massachusetts. United States patent No. 1,473,822.

PROCESS AND APPARATUS FOR MANUFACTURING TIRE CASINGS. The aim of this invention is to economize in the material, labor and equipment cost incident to the manufacture of motor vehicle tires. Briefly, the apparatus patented is a species of press constructed to seal off a definite volume of space around the inside of a pulley-band constructed tire casing and between the annular-form sealing rings of a sealing device and the abutment member of the press so that upon operation of the press the casing may be shaped with its beads in a predetermined relation and mounted fluid tight upon the sealing device, and held there by locking rings. —Ernest Hopkinson and John P. Coe, the latter assignor of his entire right to The Hartford Rubber Works Co., Hartford, Connecticut, United States patent No. 1,474,149.

Other Machinery Patents

The United States

1,469,875 Calendering rubber. L. P. Beauregard, Chicopee, Mass., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,471,588 Machine for making outsoles for rubber footwear. S. W. Bourn, Providence, Rhode Island.

1,471,787 Tire-painting machine. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,472,053 Mold for rubber goods. T. Davis, New York, N. Y.

1,472,185 Repair vulcanizing apparatus. E. A. Mollenhauer, Spokane, Washington.

1,472,256 Devices for shaping rubber articles. G. S. Stringfield, Columbus, Ohio.

1,472,764 Tire wrapping machine. J. Scherner, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,472,881 Method and apparatus for molding tire casings. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,473,509 Gravity conveyor. M. H. Pade, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

The Dominion of Canada

234,848 Apparatus for unwrapping inner tubes. The Firestone Tire & Rubber Company of Canada, Ltd., Hamilton, Ontario, Canada, assignee of L. C. Riblett, Akron, Ohio.

235,130 Apparatus for making "flat" endless tire bands. T. Sloper, Devizes, Wiltshire, England.

235,154 Die for extruding a tire tread. The Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ontario, assignee of Daniel E. Goodenberger, Akron, Ohio, U. S. A.

235,155 Apparatus for forming cuffs on inner tubes. The Firestone Tire & Rubber Co of Canada, Ltd., Hamilton, Ontario, assignee of H. D. Stevens, Akron, Ohio, U. S. A.

235,157 Tire making machine. The Goodyear Tire & Rubber Co., assignee of R. S. Trogner, both of Akron, Ohio, U. S. A.

235,158 Apparatus for making tire beads. The Goodyear Tire & Rubber Co., assignee of W. B. Harsel, both of Akron, Ohio, U. S. A.

235,160 Bead cable for tires. The International Bead Wire Co., New York, N. Y., assignee of A. C. Pratt, Deep River, Connecticut, both in U. S. A.

The United Kingdom

202,559 Machine for applying the tread strip to a built-up tire. A. E. Wite, 88 Chancery Lane, London, England.

202,719 Tire-making machine. C. M. Gautier, 14 Unwin Mansions, Queen's Club Gardens, London.

202,895 Collapsible core for molding pneumatic tires. P. De Mattia, 20 Union avenue, Clifton, New Jersey, U. S. A.

203,306 Machine for winding a strip of canvas around two endless wires so as to form a lining for pneumatic tires. Societe Anon. des Etablissements A. Olier, Usines St. Remy, Clermont-Ferrand, Puy de Dome, France.

203,372 Machine for extruding rubber. Bertrams, Ltd., St. Katherine's Works, Sciennes, Edinburgh, and W. P. Whitehouse, Bargrove, Dashwood road, Gravesend, Kent.

203,419 Apparatus for handling continuous lengths of india rubber sheets. A. Herring-Shaw and Peachey Process Co., Ltd., 83 Pall Mall, London, and D. Bridge & Co., Ltd., Castleton Iron Works, Castleton, Manchester.

Germany

Patents Issued with Dates of Issue

384,804 (June 21, 1922). Device for folding unvulcanized rubber sheets. Conrad Zucht, Grindel Allee 168, Hamburg.

384,805 (July 20, 1922). Lathe for typewriter feed rolls. Gottlob Beuttler, Echingerstrasse 9 c., Munchen-Schwabing.

384,998 (April 22, 1922). Press for making rods and tubes of artificial resin masses. Meirowsky & Co., A. G., Porz. a. Rh.

Design Patents Issued, with Dates of Issue

854,882 (August 11, 1923). Sliding device for exchanging and replacing rubber and other heels on shoe heels. J. Westphal, Johnstrasse 10, Berlin, Steglitz.

855,002 (June 10, 1920). Device for dividing solid rubber twin tires. The Dunlop Rubber Co., Limited, London; represented by: R. H. Korn, Berlin S. W. 11.

855,204 (December 6, 1922). Vulcanizing press. Niederrheinische Maschinenfabrik Becker & van Hüllen, Krefeld.

855,252 (August 18, 1923). Mold for making rubber goods. Terma-Gummiwerke, G. m. b. H., Wunstorf b. Hannover.

855,801 (January 2, 1922). Cutting machine for inserts for pneumatic covers. Dunlop Rubber Co., Limited, London; represented by: R. Wirth, C. Weihe, H. Weil, M. M. Wirth, Frankfurt-am-Main, and T. R. Koehnhorn and E. Noll, Berlin S. W. 11.

855,805 (September 22, 1922). Device for repairing flat articles of rubber. Max Voigt and Karl Heinz Meier, Naumburg a. S.

855,806 (September 29, 1922). Device for repairing flat articles of rubber. Max Voigt and Karl Heinz Meier, Naumburg a. S.

855,809 (January 18, 1923). Device for repairing flat articles of rubber. Max Voigt and Karl Heinz Meier, Naumburg, a. S.

856,665 (August 13, 1923). Spreading machine for reclaiming solvents. Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg, ander-Elbe.

Process Patents

The United States

1,469,895 Method of preventing transmigration of vulcanizing agent in rubber. J. P. Coe, Hastings-on-Hudson, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,470,442 Method of making vulcanized products. J. E. Grosjean, Lima, Ohio.

1,470,465 Method of making bead fillers. M. A. Marquette, assignor to The Fisk Rubber Company—both of Chicopee Falls, Mass.

1,471,376 Process of constructing mats. J. G. Bowser, Columbus, Kansas.

1,471,394 Method of milking. P. A. Frimand, Miami, Florida, assignor to The Burton Page Co., Chicago, Illinois.

1,471,587 Method of forming outsoles for rubber footwear. S. W. Bourn, Providence, Rhode Island.

1,471,829 Tire tread and method of applying it. F. B. Converse, assignor to the Norwalk Tire & Rubber Co., both of Norwalk, Connecticut.

1,471,905 Method of applying cord fabric to cores. T. P. Little, assignor to the Fisk Rubber Co., both of Chicopee Falls, Massachusetts.

1,472,435 Method of making inner tube for pneumatic tires. J. F. Palmer, St. Joseph, Michigan.

1,472,744 Method of making packing rings. C. H. Butler and Harry H. Jones, assignors to E. F. Houghton & Co., all of Philadelphia, Pennsylvania.

1,472,756 Method of making inner tubes for tires. A. E. Henderson, Toronto, Canada.

1,473,403 Method and apparatus for making catheters. W. H. Fox, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

The Dominion of Canada

234,789 Method of waterproofing concrete bodies. R. G. Osborne, Los Angeles, Calif.

234,883 Method of producing a composite laminated structure. H. N. Atwood, Monson, assignee of G. B. Bains, 3rd, Reading—both of Pennsylvania.

234,994 Process of repairing pneumatic tires. The Kewake Manufacturing Co., assignee of P. E. Hawkinson—both of Minneapolis, Minn.

235,131 Method of making "flat" tire fabric. T. Sloper, Devizes, Wiltshire, England

235,226 Method of tire identification. M. J. Gilligan, Cloverdale, British Columbia.

235,497 Method of making a rubber globe with world top. E. M. Walters, Hove, Essex, England.

235,649 Method of making cushion tires. Lambert Tire & Rubber Co., Barberton, assignee of C. E. Rett, and C. S. Anderson, both of Akron, Ohio, U. S. A.

The United Kingdom

202,413 Making rubber-covered tennis courts. J. F. Rutherford and W. A. C. Davis, 20 Copthall Ave., London, England.

202,563 Process of impregnating leather, pasteboard, and the like with rubber, etc. O. G. Goransson, 11 Braunkyrkagatan, Stockholm, Sweden.

202,653 Preparation of india rubber. H. S. Wills, Rose Cottage, West Lulworth, Dorset.

202,843 Method of rubber-insulating vehicles for heat and sound. Leeds Forge Co., Ltd., and W. Redpath, both of Leeds, Yorkshire.

203,468 Method of making tennis balls. Spencer, Moulton & Co., Ltd., and F. M. Panzetta, 2 Central Bldgs., Westminster.

203,666 Method of making a solid tire. Lambert Tire & Rubber Co., Barberton, Ohio, assignee of C. E. Rett, Akron, Ohio, both in U. S. A.

Germany

Patents Issued with Dates of Issue

385,782 (March 18, 1921). Method of stretching and widening elastic bodies and of mounting onto other bodies. Demetrio Maggiora, Florence, Italy; represented by: C. Fehlert, G. Loubier, F. Harmsen and E. Meissner, Berlin S. W. 61.

Flexible Rubber Automobile Wheel

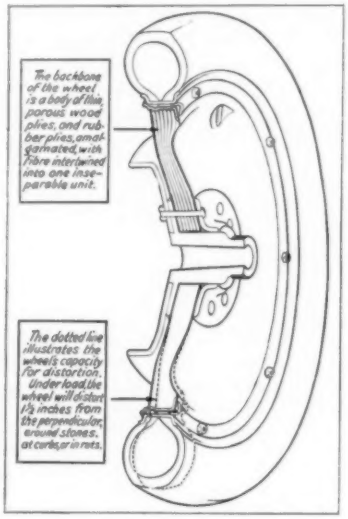
The general desire for increased ease of riding in passenger automobiles has brought about two effective developments on the part of rubber companies to meet this need. One of these developments is the balloon tire; the other, and more radical one, relates to the production of a wheel of remarkable flexibility and smooth riding effect. The performance of the new wheel is said to be so satisfactory that it may even gain general popular endorsement over balloon tires; in fact, that is the expectation of the Seiberling Rubber Co. which is manufacturing it as licensees under the Atwood patent[1].

This rubber wheel is flexible as rubber is flexible. It distorts without structural injury and automatically recovers its normal

Seiberling-Atwood Rubber Wheel

shape by its own resiliency. It thus eliminates the need of snubbers and shock absorbers with their attendant disadvantages. The outward appearance of the wheel and the principle of its construction are shown in the illustrations.

The flexible construction consists of built-up layers of rubber alternating with plies of thin porous wood. The process of curing is such that an intermingling of the wood and rubber occurs, assuring an inseparable union of the layers into a pliable unit structure. This wood-rubber stock is adaptable to many industrial purposes where strength and resiliency are requisite, because of its workability and light weight. In the case of wheels, circles are cut from it and disk wheels built with it of shaped or concave design using standard hubs and rims. The concavity of design of the Seiberling wheel combined with the bending property of the Atwood wood-rubber material produces a wheel of marked resiliency, with ability to distort about an inch and a half under load or shock.


The backbone of the wheel is a body of thin, porous wood plies, and rubber plies, amalgamated, with fibre interlaced into one inseparable unit.
The dotted line illustrates the wheel's capacity for distortion. Under load the wheel will distort 1½ inches from the perpendicular, around stones, at curbs, or in ruts.

Structural Features

Many advantages are claimed by the makers of this wheel. In the front they absorb shocks and transmit their force to the steering wheel as pulls, not as shocks. The self-alining characteristics of present front wheel construction are accentuated as the wheel comes back to normal position evenly and quickly. Road roughness, softness, sand, or ruts are accepted by the wheel and compensated by its flexibility. The wheel goes around obstructions, and shocks from irregularities are absorbed by it. Sudden pulls, which are a common cause of skidding, are eliminated and safety results. Nevertheless if a skid is forced, the rear wheels persistently seek their alinement with the front wheels. Road rumble, so noticeable in closed cars, is eliminated by these wheels quite completely.

The Seiberling wheel will accept any standard rim or hub, is manufactured in any color desired, takes and holds a high finish, and is of the same appearance as disk-type wheels of metal.

These wheels will shortly be in production for cars of the 1924 season.

[1]United States patent No. 1,442,242.

CEMENT COATED WIRE NAILS

Cement coated wire nails have practical interest and value in rubber factories and others where packing cases are utilized for the shipment of goods.

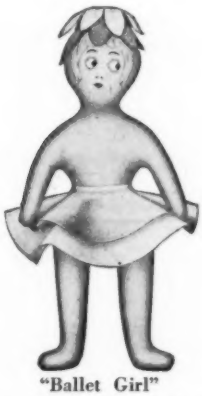
The secure nailing of factory floors subjected to the loosening effect of constant trucking provides another instance where cement coated nails demonstrate their superior holding power.

Coated wire nails show 100 per cent more holding power than the same sizes plain wire nails. A case made with plain nails is sprung open by rough handling, allowing loss and damage to the contents, whereas if nailed with coated nails the case holds together securely and insures receipt of goods at destination undamaged.

New Goods and Specialties

"Faultless" Pneumatic Dolls

Two new designs are illustrated of the popular pneumatic rubber doll, which can also be used as a bathtub toy. The "Ballet Girl" is light gray with a two-color ballet skirt and head ornament. The "Crying Baby" is red, undressed, and has a squawker attachment. Both toys are approximately 8½ inches in



"Ballet Girl"

"Crying Baby"

height. Soft, flexible, high grade stock is used in the construction, and they are carefully packed in cartons of 12 and 72 to a box.—The Faultless Rubber Co., Ashland, Ohio.

A Packard Coupe in Miniature

The American National Co., Toledo, Ohio, manufacturer of juvenile automobiles, velocipedes, etc., is marketing a miniature Packard coupe which is an exact reproduction of the real car. The body is 19 by 60 inches, blue with gold striping, with nickel-plated radiator. Heavy pneumatic tires are provided on 14 by 1⅜-inch wheels. The interior is upholstered attractively and has adjustable side curtains, rubber pedals, and lighting arrangement. The equipment includes a wing moto meter, trunk rails, road and side lamps, gear shift, etc. Other cars bear the names of other well known makes.

Solid Rubber Radiator Connection

Several distinctive points are claimed, by the manufacturers, for the radiator hose illustrated, chief among which is the fact that being made solid from a special rubber stock it will outwear ordinary hose because it will be less affected by boiling water and anti-freeze solutions, and there are no plies of duck which might separate and disintegrate. Also, the unit or solid construction is an important factor in withstanding the effects of vibration. The wall construction is particularly tough, so that even a cut in the edge of a connection will not spread under ordinary service conditions. These connections can be installed without loosening the radiator or manifold and they are ready for use just as they come, packed ten to a carton and each provided with tough, flexible clamp bands one inch wide instead of the usual metal clamp, so that there is no danger of damage from clamp-cutting.—L. H. Gilmer Co., Tacony, Philadelphia, Pennsylvania.

Gilmer Radiator Connection

"Grip-Tite" Blanket Fasteners

The simplicity of the device illustrated for holding the baby's blankets in place throughout the night is its big selling feature. It is just a pair of "Grip-Tite" clamps and a band of strong elastic which fastens around any convenient post at the top of the bed or crib. The blankets are held securely, close up over the child's shoulders, but without giving any sense of restriction. The fasteners are supplied to dealers in boxes of a dozen, with display carton and a 3-color display easel.—Security Blanket Fastener Co., 30 East 23rd street, New York, N. Y.

Blanket Fastener

Loose Inner Tube Fire Hose

The severe duty exacted of the rubber lining of fabric fire hose is much reduced and the life of the lining prolonged by the use of a separable inner rubber tube. The hose resembles somewhat an automobile casing and tube. This tube grips the fabric as though it were cemented to it because one-half of its surface is reinforced with special duck and the other half with a non-skidding strip of rubber, allowing for circumferential expansion under pressure. The duck used also provides for expansion and contraction. Specially impregnated waterproofed treatment of the hose fabric yarn in a bath of melted wax and Pará rubber supplements the separable tube in extending the durability of this improved hose.—Fabric Fire Hose Co., 127 Duane street, New York, N. Y.

Side-Car Cycle for the Youngsters

The latest improvement which the season has produced in foot-propelled vehicles for children is the side-car cycle illustrated. The body is made of high grade steel supported on a cold rolled steel axle reinforced with a steel attachment to the chassis of the car. Steel disk wheels are equipped with ball bearings and solid

Velocipede and Side-Car

rubber tires. Foot pedals and handlebar grips are of rubber. The side-car has a wood floor, an oak-finished seat and a chassis made of aluminum alloy. The cycle is made in one size only, to accommodate children up to 8 years of age.—Side-Car Vehicle Manufacturing Corporation, 137th street and Southern Boulevard, Bronx, New York, N. Y.

Vulcanized-On Crêpe Rubber Sole

Crêpe Sole Vulcanized to Shoe Fabric

The illustration shows a heavy duck shoe with a new type of crêpe rubber sole, the claim to distinction being that the sole is neither sewed nor cemented to the upper but is welded to it by vulcanization so that the rubber and fabric are inseparable. The sole, made by the Star Brand pressure cure, is thick, tough, wear-resisting and of light weight, in black or amber.—La Cross Rubber Mills Co., La Cross, Wisconsin.

Floater Balls for Water Golf

Golf enthusiasts have carried the game into the swimming pools. Water golf is played with "floater balls," or "pills" having a slightly lower specific gravity than water. A standard floater ball is the "Glory Dimple" illustrated, made by A. G. Spalding & Bros., Chicopee, Massachusetts, which is popularly priced. These balls are buoyant, impossible to lose in water, and can be given good drive and direction. Driving is done with a mashie and puting with a paddle.

The "Glory Dimple"

Rubber Bottle Cap and Scalp Massage

Of interest to the druggists' sundries trade is the combination bottle cap, scalp massage pat, and liquid dispenser illustrated. It is made of heavy white rubber and the nipples are perforated, the outer ones with larger holes than the inner, and the same rotary motion which massages the scalp also applies the liquid to the roots of the hair. A widespread advertising campaign is introducing this item over a large area. The "treatment" includes one liquid for promoting growth of the hair and for preventing it from falling out; another is intended as a cure for dandruff.—Van Ess Laboratories, Inc., 28 East Kinzie street, Chicago, Illinois.

Massaging Bottle Cap

Rubber Reinforced Breeches for Huntsmen

An item which dealers in sporting goods will no doubt approve as a sales getter the year round has been recently added to the "Drybak" line of hunting garments. It is a pair of breeches which are not only carefully tailored but which have reinforcements of rubberized duck at the seat and over the knee, extending front and back far enough over the leg to afford perfect protection from wet boat seats, damp brush and snow. They carry the usual guarantee of this line of goods: "A dry back or money back."—Lewis M. Weed Co., Inc., Binghamton, New York.

"Drybak" Hunting Breeches

Molded Natural Crêpe Rubber Sole

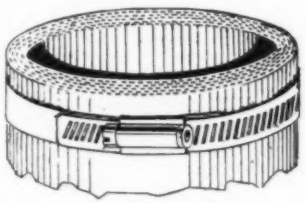
The natural crêpe rubber sole as finished on the plantation is well known for its comfort, durability and cheapness. Now comes the Mayow patent crêpe sole, made on the plantation in Ceylon, which has won its inventor well-deserved praise from the British Rubber Growers' Association for its remarkable qualifications and new features. Being molded from specially prepared pure latex directly after coagulation, instead of being built up, in the usual manner, is said to give it greater firmness with equal resiliency and absence of spreading. This minimum of milling, it is claimed, retains unimpaired the natural "nerve" or gristly texture of the rubber. Molding also enables several different styles to be made with patterns or treads specially adapted to golf, tennis, cricket, walking, or gymnasium wear.—Ceylon Rubber Products, Inc., 166 Essex street, Boston, Massachusetts, sole American agents.

GOLF OR CRICKET TENNIS OR WALKING GYMNASIUM

Types of Natural Crêpe Rubber Soles

Highly Adjustable Worm Drive Hose Clamp

The Jubilee hose clamp illustrated is said to be designed on a different principle from the usual type. A worm with heavy square-cut threads which are always engaged with 5 or 6 slots of the steel ribbon which encircles the hose exerts a direct pull on the ribbon, constantly tightening it. The worm is made with a large fillister head which cannot be stripped or mutilated and which has a deep square slot for the screw-driver. The smooth inner surface of the clamp gives an even bearing and there is equal pressure at all points as the hose is tightened. There are four sizes, which fit any hose from the ½-inch garden hose to the 3¼-inch diameter, the largest size used on automobiles. As the hose becomes soft or worn the clamp may be tightened again and again by simply screwing up the worm a fraction of a turn.—Jubilee Manufacturing Co., Omaha, Nebraska.

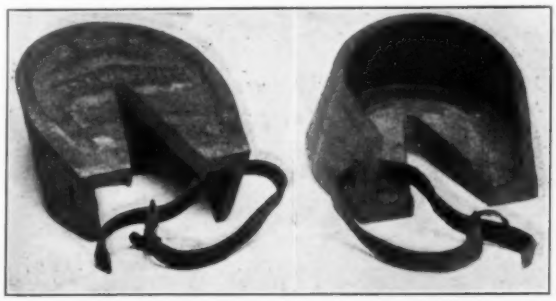


Jubilee Hose Clamp

THE HUNTINGDON MANUFACTURING CO., PHILADELPHIA, PENNSYLVANIA, is preparing to dress up its "Gray Goose" golf ball for the Christmas holidays. The Christmas container shows Santa Claus with a pack of the balls on his back, putting one into a stocking held open by an elf. The containers are supplied in bulk to dealers so that as many balls as desired may be wrapped and displayed in the windows during the Christmas shopping period.

Non-Skid Rubber Horseshoes

The accompanying illustrations show two views of a recently patented rubber horseshoe designed to prevent horses from slipping on smooth, frosty, or snow-covered roads and also as a noiseless shoe for army purposes. The first view shows the bottom



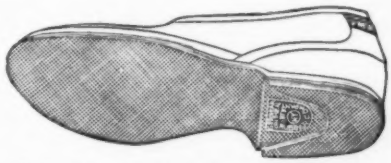
Bottom and Inside of Rubber Horseshoe

of the shoe, which is grooved to furnish road-grip and to receive the nails. The second view shows the inside of the shoe, which is also grooved, to allow the iron shoe, over which it may be worn, to be imbedded in the rubber. A wedge-shaped piece is cut out so that the shoe may be stretched to put on, and also to give frog pressure and foot ventilation. The shoe is molded in one piece of a hard wearing rubber mixture with a steel gorse and it is claimed that it will outlast an iron shoe. The inventor is looking for a purchaser of the patent rights in England and America.—T. R. Marsh, Gelli Unig Farm, Pontywain, Cross Keys, Monmouthshire, England.

DEPARTMENT STORES ARE SHOWING RUBBER ARTICLES FOR DOLLS which are exact replicas of things required for real babies. Among these are rubber slip-on panties, hot water bottles, bathing caps, and rubberized aprons of dainty designs.

Rubber Heel Taps for Overshoes

The "Uwear" heel illustrated is designed to lengthen the life of the rubber overshoe indefinitely. It is of heavy red rubber, U-shaped and equipped with a non-skid design. When vulcanized on to the regular heel of the rubber it makes it almost impossible for the heel of the shoe to push through. The taps are placed on specified shoes at a slight extra charge.—Goodyear Rubber Co., 787-9 Broadway, New York, N. Y.



The "Uwear" Heel Tap for Rubbers

The "Hindu" Cord Tire

"Hindu" Cord

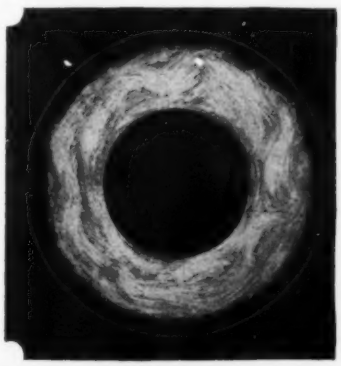
One of the latest additions to the family of The India Tire & Rubber Co. is the new 30 by 3½ standard size "Hindu" cord shown in the accompanying illustration. The cord casing is made of high grade long fiber cotton throughout and is to be sold at popular price.—The India Tire & Rubber Co., Akron, Ohio.

Rubber Preservative for Tires

The Eureka rubber preserver is a vegetable compound designed to hold the rubber of tires in a state of elasticity for an indefinite period, sealing up small punctures, stopping slow leaks, and decreasing blow-outs caused by cracking of the rubber.—Eureka Rubber Preserving Co., Huntington, West Virginia.

Playground Ball with Sponge Rubber Center

Dealers in sporting goods will be interested in this new type of playground ball, which has a sponge rubber center covered with imported kapok and wound with a fine quality of yarn, the outside being of pearl horsehide with red stitching. The sponge rubber with its many air cells provides practically an "air center" for the ball, which enables it to absorb the blows of the bat readily and to retain its shape under strenuous usage. It is believed that this type of ball will establish a new standard for the playground.—Thomas E. Wilson & Co., 2037 Powell avenue, Chicago, Illinois.



Cross-Section of "Air Center" Ball

THE SWINEHART TIRE & RUBBER CO., AKRON, OHIO, IS BRINGING out a new cushion tire known as the "Swinehart Cushion." It will be made in 30 by 3½ and 32 by 4½ sizes and will be especially adapted for use on lighter trucks, such as Fords, Chevrolets, Buicks, and Oldsmobiles.

Activities of the Rubber Association of America

Committee and Division Meetings

THE REGULAR quarterly meeting of the Tire Manufacturers' Division, which was scheduled for the latter part of October, was held in Chicago, Illinois, at the Congress Hotel, on November 1. The session was well attended by both eastern and middle western members. A general review was made of the activities of the Executive Committee during the past year and progress reports were rendered on several matters now in hand.

The postponed October meeting of the Tire Executive Committee was also held in Chicago on November 1. The word "Balloon" was formally adopted as the uniform designation for the low pressure, thin sidewall type of tire, and the association office was requested to register that word and the word "Cushion" in foreign countries, as has already been done with the terms "Cord," "Non-Skid," "Straight-Side," "Truck," and "Tread." The Committee recommended the appropriation by the Board of Directors of the association of funds to defray the expense of making a survey of tire dealers' inventories. A number of other matters pertaining to the tire trade were discussed.

The Rubber Reclaimers Division of the association met at the Yale Club, New York, on November 1. The reclaimers accepted the invitation of the Bureau of Standards, at Washington, to assist that organization in its research work on reclaimed rubber, which has as its purpose the extension of the use of reclaimed and the improvement of manufacturing processes of that commodity. The standards of scrap rubber specifications and packing were modified slightly. The form in which the monthly statistics on scrap and reclaimed rubber have been compiled was also changed and new by-laws were adopted.

The Accounting Committee met at the Yale Club, New York, on November 13, and progressed its work in the formulation of uniform costing accounting fundamentals and principles for rubber manufacturers. The committee expects to be able to release its first concrete report thereon to the membership of the association in the near future.

A two-day meeting of the Service Managers Committee of the Tire Division was held on November 22 and 23. The session was given over to the formulation of the pamphlet "The care of Pneumatic Truck Tires."

The regular quarterly meeting of the Mechanical Rubber Goods Manufacturers Division was held at the Yale Club on November 23. A resolution was adopted endorsing the recognition at some future date of 5/8-inch as the standard size for garden hose, and a committee was appointed to recommend ways and means of making the plan effective. The Board of Directors of the association was requested to appropriate $5,000 for publicity purposes in connection with this program, to be expended at the discretion of the Executive Committee of the division. The division approved the recommended concentration of hose wire purchases on the basis of twenty-one suggested standard sizes and types, as proposed by the Specification Committee.

The Tire Executive Committee held its regular monthly meeting on November 21, and the Board of Directors met on November 22.

The November regular meeting of the Traffic Committee was held in the Hotel Sherman, Chicago, Illinois, on November 13, by reason of the Annual Meeting of the National Industrial Traffic League that was held at the same place on November 14 and 15. The committee gave further consideration to the propriety of applying to the carriers for changes in the rates on reclaimed rubber, and this subject is now under investigation. Other matters pertaining to railroad and steamship transportation of rubber products were also handled at this meeting.

On November 15, the Traffic Committee appeared before the Consolidated Freight Classification Committee in Chicago and gave a demonstration of the use of a new method of bundling automobile tires by use of twisted annealed wire. This method of bundling tires is not permitted at present by the classification specifications but as a result of the demonstration the Consolidated Classification Committee approved its use and will place the specifications in effect in a supplement to the classification at an early date.

Statistics Compiled from 1923 Questionnaire Covering the Third Quarter of 1923[1]

RECLAIM AND SCRAP	Reported by Manufacturers Who Also Reclaim (22)	Reported by Reclaimers Solely (7)	Total
Number of tons reclaimed rubber produced from raw and cured scrap	5,287	9,821	15,108
Number of tons scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber	7,764	11,921	19,685

NUMBER OF TONS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

PRODUCT	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	27,237	$100,707,000
Automobile and motor truck pneumatic tubes	8,065	19,263,000
Motorcycle tires (casings and tubes)	78	349,000
Bicycle tires (single tubes, casings and tubes)	197	819,000
All other pneumatic casings and tubes not elsewhere specified	*3	67,000
Solid tires for motor vehicles	2,208	5,867,000
All other solid tires	108	249,000
Tire sundries and repair materials	532	3,241,000
Totals—Tires and tire sundries	38,428	$130,562,000
Other Rubber Products:		
Mechanical rubber goods	3,214	$19,825,000
Boots and shoes	3,845	37,018,000
Insulating wire and insulating compounds	862	6,845,000
Druggists' sundries, medical and surgical rubber goods	486	3,124,000
Waterproof cloth, clothing and rubber sheeting	568	5,400,000
Hard rubber goods	481	1,693,000
Heels and soles	913	3,704,000
Miscellaneous, not included in any of above items	1,262	5,027,000
Totals—Other rubber products	11,631	$82,639,000
Grand Total—All products	50,059	$213,201,000

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR UNITED STATES PORTS, SEPTEMBER 30, 1923.

ON HAND	Long Tons: Plantation	Pará	All Other
Manufacturers	64,670	2,877	1,517
Importers and dealers	15,065	1,376	153
Totals	79,735	4,253	1,670

Grand total—On hand, 85,658

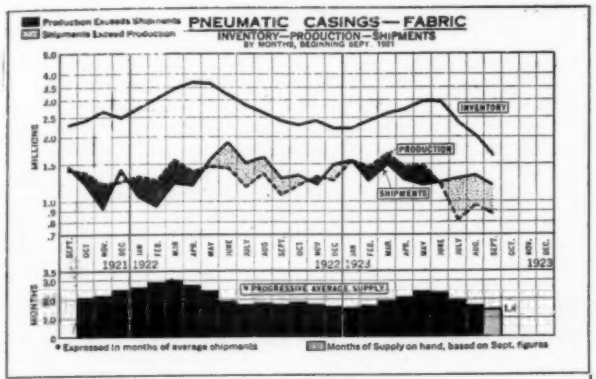
AFLOAT	Long Tons: Plantation	Pará	All Other
Manufacturers	8,838	5	.....
Importers and dealers	15,522	308	135
Totals	24,360	313	135

Grand total—Afloat, 24,808

*Less complete than corresponding sales value of $67,000.

[1]Number of rubber manufacturers that reported data was 234; crude rubber importers and dealers, 43; reclaimers (solely), 7; total daily average number of employes on basis of third week of July, 1923, was 150,384. With the exception of the crude rubber inventory at 95 per cent, the figures are believed to represent approximately 90 per cent of the United States rubber industry.

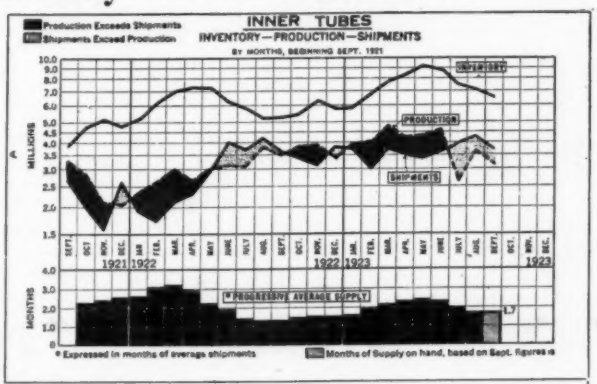
Rubber Association Monthly Tire Statistics



	Total Shipments	Production	Inventory
Sept. 1921			2,238,576
Oct.	1,447,516	1,399,424	2,387,566
Nov.	1,217,983	1,351,321	2,630,641
Dec.	916,101	1,200,379	2,448,456
Jan. 1922	1,400,094	1,224,823	2,759,431
Feb.	1,040,475	1,300,715	3,079,854
Mar.	950,105	1,266,397	3,414,922
Apr.	1,197,328	1,544,860	3,636,080
May	1,172,218	1,369,631	3,600,231
June	1,548,858	1,469,887	3,153,971
July	1,858,378	1,456,792	2,825,785
Aug.	1,511,542	1,161,965	2,584,123
Sept.	1,588,474	1,351,617	2,410,608
Oct.	1,278,170	1,079,125	2,316,056
Nov.	1,329,850	1,201,520	2,410,690
Dec.	1,202,618	1,300,686	2,185,593
Jan. 1923	1,477,006	1,261,459	2,211,440
Feb.	1,338,814	1,316,361	2,409,005
Mar.	1,249,468	1,454,224	2,552,939
Apr.	1,502,822	1,667,083	2,705,897
May	1,275,671	1,452,709	2,970,766
June	1,212,969	1,472,544	2,944,655
July	1,229,324	1,184,431	2,362,271
Aug.	1,281,821	819,947	2,034,771
Sept.	1,319,615	963,728	1,663,823
Oct.	1,214,777	860,441	

PERCENTAGES OF INCREASE OR DECREASE FOR SEPTEMBER, 1923, COMPARED WITH AUGUST AND WITH SEPTEMBER, 1922

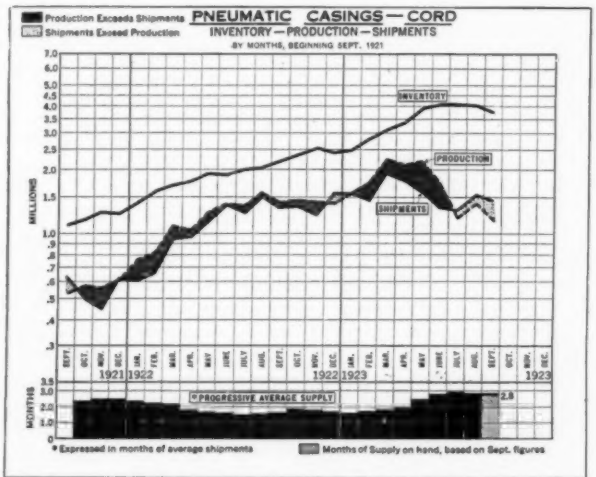
	Compared with August	Compared with September, 1922
Inventory, shows	a decrease of 18.2%	a decrease of 31.0%
Production, shows	a decrease of 10.7%	a decrease of 20.3%
Total shipments, show	a decrease of 7.9%	a decrease of 5.0%
Original equipment, shows	a decrease of 20.5%	an increase of 97.4%
Other sales, show	an increase of 3.1%	a decrease of 30.5%
Export, shows	an increase of 41.3%	a decrease of 40.5%



	Total Shipments	Production	Inventory
Sept. 1921			3,827,630
Oct.	2,664,277	3,274,822	4,732,016
Nov.	2,038,967	2,845,918	5,293,560
Dec.	1,553,104	2,126,211	4,731,824
Jan. 1922	2,555,737	2,070,008	5,246,647
Feb.	1,913,776	2,543,393	6,141,956
Mar.	1,732,316	2,596,774	6,991,118
Apr.	2,135,975	3,017,511	7,239,996
May	2,371,623	2,610,773	7,189,552
June	2,996,450	2,970,006	6,184,734
July	4,043,301	3,130,629	5,675,839
Aug.	3,670,707	3,068,224	5,287,228
Sept.	4,239,661	3,501,442	5,164,757
Oct.	3,597,929	3,787,758	5,488,023
Nov.	3,403,597	3,850,908	6,210,033
Dec.	3,123,587	3,411,074	5,732,125
Jan. 1923	3,487,444	3,951,885	5,838,319
Feb.	3,616,131	4,039,202	6,771,958
Mar.	3,063,883	4,875,414	7,740,845
Apr.	3,910,582	4,259,558	8,394,184
May	3,618,495	4,317,537	9,292,223
June	3,468,394	3,590,011	8,924,336
July	3,661,527	3,577,822	7,527,281
Aug.	4,030,253	2,666,354	6,859,578
Sept.	4,350,239	3,254,575	6,457,455
Oct.	3,724,724		

PERCENTAGES OF INCREASE OR DECREASE FOR SEPTEMBER, 1923, COMPARED WITH AUGUST AND WITH SEPTEMBER, 1922

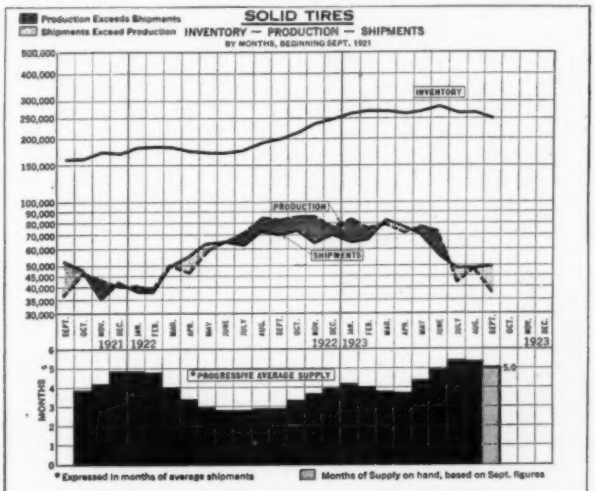
	Compared with August	Compared with September, 1922
Inventory, shows	a decrease of 7.0%	an increase of 25.0%
Production, shows	a decrease of 9.0%	a decrease of 7.1%
Total shipments, show	a decrease of 14.4%	an increase of 3.5%
Original equipment, shows	a decrease of 10.8%	an increase of 49.5%
Other sales, show	a decrease of 15.6%	a decrease of 6.5%
Export, shows	a decrease of 11.1%	an increase of 5.6%



	Total Shipments	Production	Inventory
Sept. 1921			1,102,222
Oct.	634,771	529,844	1,177,464
Nov.	501,115	576,950	1,277,701
Dec.	448,550	556,176	1,248,963
Jan. 1922	623,840	615,115	1,423,785
Feb.	605,005	754,419	1,611,475
Mar.	657,894	817,911	1,780,364
Apr.	938,203	1,100,939	1,888,256
May	967,646	1,031,556	1,952,864
June	1,157,464	1,251,616	1,888,176
July	1,352,097	1,352,096	2,000,321
Aug.	1,236,742	1,314,671	2,045,269
Sept.	1,526,613	1,533,592	2,251,429
Oct.	1,277,153	1,425,619	2,366,902
Nov.	1,320,937	1,473,142	2,554,286
Dec.	1,233,496	1,432,448	2,413,615
Jan. 1923	1,553,246	1,395,483	2,484,528
Feb.	1,546,859	1,608,809	2,816,382
Mar.	1,426,161	1,763,703	3,117,662
Apr.	1,924,670	2,108,643	3,382,375
May	1,804,072	2,086,617	3,935,828
June	1,631,474	2,187,462	4,096,145
July	1,346,673	1,772,512	4,168,853
Aug.	1,315,664	1,173,142	4,026,140
Sept.	1,532,419	1,369,703	3,733,734
Oct.	1,457,778	1,169,140	

PERCENTAGES OF INCREASE OR DECREASE FOR SEPTEMBER, 1923, COMPARED WITH AUGUST AND WITH SEPTEMBER, 1922

	Compared with August	Compared with September, 1922
Inventory, shows	a decrease of 7.3%	an increase of 69.6%
Production, shows	a decrease of 15.9%	a decrease of 18.0%
Total shipments, show	a decrease of 4.9%	an increase of 14.1%
Original equipment, shows	an increase of 1.8%	an increase of 14.2%
Other sales, show	a decrease of 7.5%	an increase of 13.5%
Export, shows	a decrease of 4.2%	an increase of 38.0%



	Total Shipments	Production	Inventory
Sept. 1921			161,832
Oct.	52,039	37,441	163,299
Nov.	48,047	46,274	173,451
Dec.	35,387	43,537	165,515
Jan. 1922	41,570	40,478	181,780
Feb.	38,565	49,224	183,448
Mar.	38,536	39,692	182,197
Apr.	50,092	49,433	173,740
May	54,302	46,664	170,904
June	62,940	57,440	160,862
July	65,595	64,089	170,375
Aug.	62,383	71,586	180,688
Sept.	72,643	64,313	200,016
Oct.	69,512	82,767	213,542
Nov.	74,379	85,680	234,664
Dec.	64,386	85,775	244,061
Jan. 1923	69,742	77,221	252,462
Feb.	65,711	83,343	270,191
Mar.	67,084	75,457	265,843
Apr.	82,405	79,788	260,631
May	76,204	71,468	250,323
June	71,114	77,288	263,425
July	56,170	72,445	263,891
Aug.	49,126	62,345	282,810
Sept.	49,667	48,141	245,719
Oct.		37,074	249,379

PERCENTAGES OF INCREASE OR DECREASE FOR SEPTEMBER, 1923, COMPARED WITH AUGUST AND WITH SEPTEMBER, 1922

	Compared with August	Compared with September, 1922
Inventory, shows	a decrease of 5.1%	an increase of 24.7%
Production, shows	a decrease of 23.0%	a decrease of 55.2%
Total shipments, show	an increase of 1.9%	a decrease of 29.0%
Original equipment, shows	an increase of 13.4%	a decrease of 16.2%
Other sales, shows	a decrease of 5.7%	a decrease of 37.1%
Export, shows	an increase of 32.3%	an increase of 18.7%

The Textile Exposition at Boston

Textile Show and National Association of Cotton Manufacturers' Convention

THE International Textile Exposition and Power Show at Mechanics Building, Boston, Massachusetts, during the week of October 29, held under the auspices of the Textile Exhibitors' Association, excelled all previous efforts in the number and variety of exhibits. A record daily attendance of textile men and the general public watched the progress of raw cotton and wool into a variety of finished products and examined with interest the latest improved textile machinery, supplies, fabrics and appliances, the mechanical exhibits being for the most part in actual operation. It was a comprehensive, well balanced and departmentalized exhibition of great educational value alike to practical mill men, distributors of fabrics, and the general public.

National Association Convention

In connection with the Exposition the 115th semi-annual meeting of the National Association of Cotton Manufacturers was held at the Copley Plaza Hotel on October 31 and November 1, and drew over 1,000 leading textile men from all sections of the country.

The first day's program was devoted to business sessions, reports of committees and papers and discussions on industrial relations and fuel problems. That of the second day consisted of papers and discussions on the development of cotton fabrics in respect to design, manufacture and distribution, followed by a technical session presided over by A. E. Jury, of the textile department of the United States Rubber Co., New York, N. Y. The progress of a century was reviewed and considerable attention devoted to artificial silk.

Speaking briefly regarding the relation of technically trained men to developments in cotton manufacture, Mr. Jury predicted that they will have a broader field in the industry as time goes on. Stating that, so far as he knew, the textile industry is the only one in this country that has the advantage of schools ranking with the best colleges whose special business it is to turn out technically trained men, he made a plea for the graduates of these technical institutions who go into the industrial field.

The Banquet

The supper-cabaret and convention banquet at the Copley Plaza Hotel were both well attended. At the latter Robert Amory, president of the National Association of Cotton Manufacturers, reviewed the present trade situation, compared northern and southern manufacturing conditions, and gave a graphic presentation of the burdens that seventeen restrictive laws have placed on the textile industry in Massachusetts and which are driving it southward. The advantages of New England, he said, are many and its handicaps mostly self-made. He believes the tide is turning and that no more legislative discouragements will be imposed.

Exhibits

Many splendid exhibits presented a greater variety of textile machinery in operation, power transmission devices, mill supplies, and cotton, woolen and silk fabrics than have been shown at any previous textile exposition. The display of novel textile machines and devices was easily the leading feature, although such an extraordinarily comprehensive collection of fabrics has never before been seen.

Of the more than three hundred exhibitors representing practically every branch of the textile and allied industries, several were of, or important purveyors to, the rubber trade. Among them may be mentioned the following:

AMERICAN SCHAEFFER & BUDENBERG CORPORATION, BROOKLYN, NEW YORK. Indicating and recording gages and thermometers, temperature regulators, safety and relief valves, steam traps, etc.

AMERICAN WRINGER CO., INC., WOONSOCKET, RHODE ISLAND. Rubber rolls, pipe and bearing stock for use in submerged bearings.

THE BRISTOL CO., WATERBURY, CONNECTICUT. Recording gages, thermometers, psychrometers, tachometers, pyrometers, temperature control apparatus, safety set screws and steel belt lacing.

H. W. BUTTERWORTH & SONS CO., PHILADELPHIA, PENNSYLVANIA. Manufacturer of the cell dryer. Tenters, guiders, winders and motor-generator sets for textile machinery.

CARRIER ENGINEERING CORPORATION, NEWARK, NEW JERSEY. Humidifying equipment, ejector processing cabinet, automatic temperature and humidity control instruments, and industrial piping.

COOPER HEWITT ELECTRIC CO., HOBOKEN, NEW JERSEY. The well-known Cooper Hewitt light.

CURTIS & MARBLE MACHINE CO., WORCESTER, MASSACHUSETTS. Manufacturer of textile handling and cleaning machinery. Rolling machine with unrolling frame and selvedge turning attachment; picker cylinder.

A. KLIPSTEIN & CO., NEW YORK, N. Y. Industrial chemicals, dyestuffs, gums, and oils.

LAWRENCE & CO., BOSTON, MASSACHUSETTS. Selling agents for International Cotton Mills. Tire fabrics, hose and belting, ducks, and a comprehensive collection of the products of the various mills it represents.

LINK-BELT CO., PHILADELPHIA, PENNSYLVANIA. Silent chain drives.

MASON REGULATOR CO., DORCHESTER, MASSACHUSETTS. Reducing valves, pump governors, damper regulators, special gradual opening valves, etc.

MORSE CHAIN CO., ITHACA, NEW YORK. Silent chain drives.

NATIONAL ANILINE & CHEMICAL CO., INC., NEW YORK, N. Y. Manufacturer of rubber accelerators. Dyestuffs and dyed and printed textiles.

B. F. PERKINS & SON, INC., HOLYOKE, MASSACHUSETTS. Cloth piler, 5-roll calender, size pump, Mullen testers, ventilating fans, bleach ejectors, thickness gages, and combination calender roll.

HENRY L. SCOTT & CO., PROVIDENCE, RHODE ISLAND. Scott testing machines for the textile and rubber industries.

C. J. TAGLIABUE MANUFACTURING CO., BROOKLYN, NEW YORK. Tag automatic controllers for temperature, pressure and humidity, recording and indicating thermometers, hydrometers, pressure gages, etc.

TAYLOR INSTRUMENT COMPANIES, Rochester, New York. Indicating and recording thermometers, and temperature regulators.

TEXTILE-FINISHING MACHINERY CO., PROVIDENCE, RHODE ISLAND. Finishing machinery.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO., EAST PITTSBURGH, PENNSYLVANIA. Motors, dynamos, mill lighting equipment, etc. Micarta material with a cotton duck base for noiseless gears, airplane propellers and other purposes.

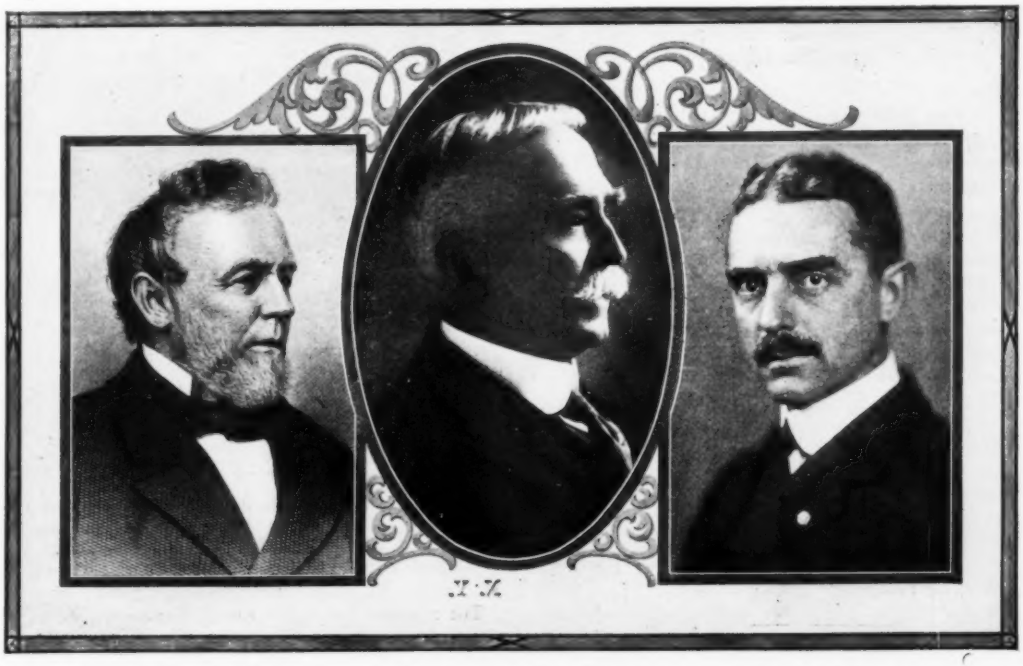
OFFICIALS ELECTED BY UNDERWRITERS' LABORATORIES

On November 10 at a special meeting of the board of directors of Underwriters' Laboratories Dana Pierce was chosen president of the organization, and A. R. Small elected first vice president. D. B. Anderson and L. B. Headen will continue as secretary and treasurer, respectively.

Three Generations of Rubber Men

UNCOMMON even in the older industries of the United States the occurrence of three generations in the rubber trade is unusual enough to merit more than casual comment, especially when the members of each of the succeeding families have been industrial leaders of exceptional ability, achievement, and prominence, as have been the Messrs. Henry Hotchkiss, Henry L. Hotchkiss, and H. Stuart Hotchkiss.

Of pioneer Yankee stock, the Hotchkiss family has for two and a half centuries been foremost in the business life and the public welfare activities of New Haven, Connecticut. The founder of the family in this country was Samuel Hotchkiss, who came from Sussex County, England, in 1641. Early in the last century Justus Hotchkiss and his uncle, Russell Hotchkiss, were noted lumber merchants on Long Wharf. Justus died in 1812; leaving two sons, Henry and Lucius, who were educated at Fairfield Academy. From 1819 to 1822 Henry (who was born in 1801) was a clerk for his uncle, who continued the business established by Justus and himself and became a partner in 1822. His uncle retiring in 1828, Henry with his brother Lucius carried on the business as their own until 1850, having greatly extended it and other interests.



Henry Hotchkiss Henry Lucius Hotchkiss H. Stuart Hotchkiss

Henry Hotchkiss

The name of Hotchkiss began to be associated with rubber in the early forties, when the brother financed the late Leverett Candee, one of the first Goodyear licensees for manufacturing rubber footwear; and on September 7, 1843, they became special partners in the firm of L. Candee & Co. When the concern became a joint stock company in 1852, Mr. Candee was chosen president. In 1863 Henry Hotchkiss was chosen president and treasurer, which positions he held until 1869. He was a forceful business man and very public spirited. He was one of the corporators of Holmes, Booth & Hayden, of Waterbury, Connecticut, was for twenty-one years president of the New Haven County Bank, one of the corporators of the New Haven and New London Railroad, and afterward a trustee for the bondholders until a new company had been formed, the Shore Line, since leased to the New York, New Haven & Hartford Railroad. He was also the first president of the Union Trust Co., and after his death in 1871 he was succeeded in that office by his son, Henry L. Hotchkiss.

Mr. Hotchkiss' mother was Elizabeth Daggett Prescott, daughter of the senior member of the well-known shipping firm of Prescott & Sherman, and descendant of John Prescott, who came from England to Boston in 1640 and from whom were descended Colonel William Prescott of Bunker Hill fame and William H. Prescott the historian.

Henry Lucius Hotchkiss

Henry Lucius Hotchkiss, president of L. Candee & Son, and son of Henry Hotchkiss, was born in New Haven, December 18, 1842; and in the city of his birth he has lived all his life and has not only built up a business that has been of great benefit to the community but has also taken an active part in every movement for civic benefit. He was educated at Williston Academy, Easthampton, and early developed a decided bent for business. From 1860 to 1863 he was paymaster of the New Haven and New London Railroad, of which his father was a trustee, and also assisted his father when the latter was president of the United States Pin Co. In February, 1863, he was elected secretary of L. Candee & Co., and soon afterward was made treasurer, his father having resigned that position, and he continued to fill both places until at the death of his father he was chosen president. For several years he also remained treasurer.

Although a fire on November 19, 1877, destroyed the factory of L. Candee & Co. completely, in the busiest season of the year, Mr. Hotchkiss lost no time in leasing factories for temporary use, and soon had the old ones built on a finer and larger scale than before. In 1892 L. Candee & Co. joined with many other prominent rubber corporations in forming the United States Rubber Company, but Mr. Hotchkiss still remains the head and manager of the internal affairs of the company and gives it his close personal supervision. He has been a director of the big rubber company since it was organized and for the first seven years of its life served on the executive committee, retiring from that position in 1899 to travel in Europe.

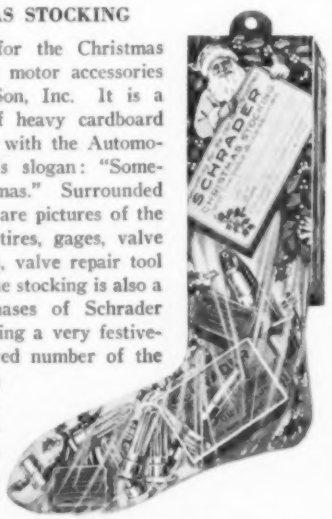
Succeeding his father in 1871, Mr. Hotchkiss continued as president of the Union Trust Co. of New Haven until 1912, and for over forty years he was a director in the National New Haven Bank. He is a trustee of the Hopkins Grammar School, was one of the original stockholders of the Revere Rubber Co., a director from 1883 to 1898 and president in 1888; and he was also a director of the Rubber Manufacturers' Mutual Insurance Co. from 1884 to 1901.

H. Stuart Hotchkiss

H. Stuart Hotchkiss, son of Henry L. Hotchkiss, was born in New Haven, October 1, 1878, and was educated at Taft School, Phillips Academy, Andover, and at Yale (1900). He began his rubber experience with L. Candee & Co., New Haven, in 1901, and has been continuously with the United States Rubber Co. system ever since. He has traveled extensively in North and South America and in Europe, and has devoted much time to development of plantations in Sumatra and the Malay Peninsula. He is vice president of the United States Rubber Co., president of the General Rubber Co., president of the United States Rubber Plantations, Inc., and director of the Chatham & Phenix National Bank, New York, the New Haven Gas Light Company, Union & New Haven Trust Co., etc. Mr. Hotchkiss served as chairman of the Committee on Rubber, U. S. Council of Defense, from April, 1917, until commissioned as Captain in the Signal Corps in October, 1917. He afterward served with the rank of major and lieutenant colonel as assistant chief of inspection, equipment division, signal corps; as senior assistant military attaché, American Embassy, London; and as chief of raw material production, air service, Washington. He is a councillor of the American Geographical Society and a fellow of the Royal Geographical Society, London.

SCHRADER CHRISTMAS STOCKING

An effective sales help for the Christmas trade is being distributed to motor accessories dealers by A. Schrader's Son, Inc. It is a Christmas stocking made of heavy cardboard and bearing a greeting card with the Automotive Equipment Association's slogan: "Something for the car for Christmas." Surrounded by decorations of the season are pictures of the various Schrader products—tires, gages, valve insides, valve caps, dust caps, valve repair tool and pump connection, etc. The stocking is also a container, into which purchases of Schrader products may be placed, making a very festive-looking package. Any desired number of the stockings are furnished upon request to dealers, for window display and inside decoration as well as for packaging.—A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y.



Gift Advertising Container

STEDMAN PRODUCTS CO. EXHIBIT

The accompanying picture of the skyline of New York City, showing buildings, cloud effects, and every tone of light and shade, is of peculiar interest because it is executed entirely in rubber.

To our knowledge, this is the first time in the history of the rubber industry that such elaborate and artistic scenic effects have been achieved where the artist used rubber as a medium instead of palette and brush.

This remarkable picture was the feature of the exhibit of the Stedman Products Co., South Braintree, Massachusetts, at the recent Hotel Exhibition, Grand Central Palace, New York, N. Y.

Decorative Effects in Marbleized Rubber Shown as Paneling, Pilasters, Inlaid Mural Painting, and Ornamental Border

The object of the exhibit was to demonstrate the extreme versatility of rubber as fabricated by the Stedman company and to establish reinforced rubber in its properly enlarged sphere not only from the standpoint of utility, cleanness, durability and silence when used as a floor covering, but decoratively on walls in frescoes, panels, etc.

LINKING MOTOR TRANSPORT WITH THE RAILWAYS

As a means toward advancing a plan for the development of a balanced national system of transportation, a special committee has been appointed and a report has been made to the Chamber of Commerce of the United States regarding the relation of highways and motor transport to other transportation agencies. Some sweeping changes in prevailing methods of handling and distributing freight have been proposed, while recommendations have been made as to the wider use of self-propelled railway cars and the extension of passenger bus service. Members of the committee include executives connected with important industries.

AT A MEETING OF THE AMERICAN MANAGEMENT ASSOCIATION held October 30 at the Hotel Astor, New York, N. Y., C. S. Ching, of the United States Rubber Co., and Dr. R. S. Quinby of the Hood Rubber Co., were noted as being among the members elected to constitute a board of directors.

News of the American Rubber Trade

Financial

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	Pfd.	$3.00	Dec. 15	Dec. 1
Boston Woven Hose & Rubber Co.	Com.	$1.50	Dec. 15	Dec. 1
Converse Rubber Shoe Co..	Pfd.	$7.00a	Dec. 1	Nov. 15
Converse Rubber Shoe Co...	Pfd.	3½% s.a.	Dec. 1	Nov. 15
Firestone Tire & Rubber Co. 7%	Pfd.	1¾% q.	Nov. 15	Nov. 1
Hood Rubber Products Co...	Pfd.	1¾% q.	Dec. 1	Nov. 20
Miller Rubber Co.....	Pfd.	2 % q.	Dec. 1	Nov. 1
Miller Rubber Co.....	Pfd.	1 % extra	Dec. 1	Nov. 1

New York Stock Exchange Quotations

November 23, 1923

	High	Low	Last
Ajax Rubber, com.....	7½	6⅞	7
Fisk Rubber, com.....	8⅝	7⅜	8
Goodrich, B. F., Co., com.....	22¾	21	22
Goodrich, B. F., Co., pfd.....	76¾	76	76¾
Goodyear Tire & Rubber, pfd.....	42¾	42¾	42¾
Goodyear Tire & Rubber prior pfd. (8)..	91	91	91
Kelly-Springfield Tire, com.....	29⅝	27¾	29⅛
Keystone Tire & Rubber, com.....	3⅛	3	3⅛
Lee Rubber & Tire, com.....	14¾	14	14⅜
United States Rubber, com.....	38⅞	36½	37⅝
United States Rubber, 1st pfd. (8).....	88	86¾	88

Akron Rubber Stock Quotations

Quotations of November 24, supplied by App-Hillman Co., Akron, Ohio.

	Last Sale	Bid	Asked
American com.	7¾	7½	10
American pfd.	50	..	35
Amazon com.	2½	2	3
Firestone com.	66	66	..
Firestone 6% pfd.....	90	90¼	91
Firestone 7% pfd.....	90½	90½	91
General com.	153	150	155
General 7% pfd.....	94⅝	93	95
Goodrich 6½s	98	97¾	98¼
Goodyear com.	9⅛	9	9⅛
Goodyear 7% pfd.....	42¾	40	43
Goodyear 1st Mtg. 8s.....	114¾	114½	115
Goodyear deb. 8s.....	101	100¾	101¼
India com.	66	..	70
India 7% pfd.....	80	78	85
Mason com.	1½	1¼	1¾
Mason 7% pfd.....	15	14½	15½
Marathon com.	2	..	2
Miller com.	60	60	65
Miller 8% pfd.....	90	89	91
Mohawk com.	6	..	6
Mohawk 7% pfd.....	40	38	..
Rubber products	20	10	16
Seiberling com.	5	4¾	5½
Seiberling 8% pfd.....	35	33	41
Star com.	15	..	20½
Star 8% pfd.....	80	..	80

The Fisk Rubber Co.

The Fisk Rubber Co. reports sales for the first nine months of 1923 as $41,800,000. Net earnings available for interest are $3,740,000, or more than three times the actual deductions for interest and financing charges for the period.

After deducting all charges and setting up reserves for Federal taxes and other contingencies, the net profit carried to surplus for the three quarters amounted to $2,103,000, bringing the surplus at the end of the nine months up to $5,631,000.

Net tangible assets are placed at $40,532,379 after deducting all liabilities and reserves except the $9,000,000 first mortgage bonds outstanding on September 30. The amount of net tangible assets per $1,000 bond was $4,504, of which more than $2,820 was in current assets.

Current assets as of September 30 are reported as $25,380,000, compared with the current liabilities of $8,354,000, leaving a balance of more than $20,000,000 as working capital and a current ratio of approximately 4.7 to 1. The net current assets exceed the amount of first preferred stock outstanding by more than $1,000,000.

The profit and loss and surplus amount for the nine months shows gross sales, less reserves and allowance, of $41,826,601. After deducting cost of sales, including depreciation, selling and administration expenses of $38,084,778, the net operating profit amounts to $3,741,823.

New Incorporations

Alton Rubber Co., October 27 (Massachusetts), $1,500. James Simon, president, 24 Lorne street, Dorchester, Massachusetts; David Adelson, treasurer, Revere, Massachusetts; Lawrence N. Barry, clerk, 36 Foster street, Medford, Massachusetts. Principal office, Boston, Massachusetts. To buy, sell, and deal in used rubber, mill machinery, rubber cloth remnants, rubberized fabrics and all kinds of rubber goods and also a general merchandising of all goods of whatever name and nature.

Bemis Manufacturing Associates, November 1 (Massachusetts), $145,000. Arthur F. Townsend, president; David L. Clark, vice president; Robert M. Bowen, treasurer. Principal office, Watertown, Massachusetts. To manufacture all kinds of gutta percha products.

Bison Tire Co., Inc., November 1 (New York), 1,000 shares, no par value. Max Becker, 73 Lexington avenue; Geo. L. Mathewson, 841 Auburn avenue; all of Buffalo, New York. Principal office, Buffalo, New York. To deal in automobile tires.

Ceylon Rubber Products, Inc., October 22 (Massachusetts), $50,000. Arundel W. Faulkner, president, Wollaston, Massachusetts; Arthur H. Holbrook, treasurer, 166 Essex street, Boston, Massachusetts; Louis E. Flye, clerk, 68 Devonshire street, Boston, Massachusetts. Principal office, 166 Essex street, Boston, Massachusetts. To make and to deal in rubber products and all kinds of materials in making boots and shoes and to import rubber soles and other rubber goods.

Consumers Tire Manufacturing Co., October 30 (North Carolina), $100,000. George A. Phillips; Fenner T. Phillips; A. H. Phillips; Frank C. Kugler; Richard C. Leach; A. D. McLean; W. B. Rodman, Jr. Principal office, Washington, North Carolina. To manufacture, sell and deal in automobile tires, casings, tubes, etc.

Coraja Rubber Co., of California, September 7 (California), $150,000. Ralph I. Guy, president; Robert A. Duffy, vice president; L. B. Rice, secretary-treasurer. Principal office, 111 North Western avenue, Los Angeles, California. To manufacture Coraja, a patented product, and Pantosote top patch.

Enterprise Rubber Co., Inc., October 15 (New Jersey), $100,000. Leo McCue, 875 Brunswick avenue; Jeanne E. Catana, 217 Center street; John Masich, 223 Grand street, all of Trenton, New Jersey. Principal office, 137-139 East State street, Trenton, New Jersey. To manufacture, buy, sell, import and export, trade and deal in all or any kind of rubber goods, specialties and general merchandise.

Fisk Tire Export Co., November 10 (Delaware), 1,000 shares without nominal or par value. Karl S. Chamberlain, 112 West 72nd street; Augustus C. Walker, 132—95th street; Herbert Walmsley, 620 West 116th street, all of New York City. Principal office, Ford Building, Wilmington, Delaware. To engage in export trade as defined by Act of Congress.

Fremont Rubber Products Co., October 15 (Ohio), $25,000. F. X. Chudzinski; J. M. Myers; P. H. Druckenmiller; L. D. Weber; Thomas J. Maxwell; all of Fremont, Ohio. Principal office, Fremont, Ohio. To manufacture rubber products.

Goodyear Rubber Plantations, Inc., The, November 8 (Delaware), $6,615,000. T. L. Croteau; M. A. Bruce; A. M. Hooven, all of Wilmington, Delaware. Principal office, duPont Building, Wilmington, Delaware. To carry on a rubber business.

Goodyear Tire & Rubber Co. of California, October 5 (Delaware), $50,000. E. G. Wilmer, president, Akron, Ohio; A. F. Osterloh, vice president and general manager; Walter I. Lyon, secretary; M. S. Kelley, treasurer, all of Los Angeles, California. Principal office, Los Angeles, California. To facilitate sales in territory.

Houk Rubber Co., October 24 (Ohio), 10,000 shares no par value. Henry L. Hook; J. P. Frisby; H. L. Arbogast; C. P. Kennedy; F. R. Ormsby. Principal office, Akron, Ohio. To manufacture rubber tires, tubes and other rubber specialties.

Jersey Rubber Co., September 27 (New Jersey), $25,000. Thomas A. Farrell; Annie E. Farrell, both of East Rutherford, New Jersey; William H. I. Ely, Rutherford, New Jersey. Principal office, 10 Ames avenue, Rutherford, New Jersey. To buy, produce, sell, trade, and deal in any and all kinds of crude, refined and manufacturing rubber, gutta percha, chicle and other gums.

Lundstrom Rim Corporation, November 13 (Delaware), $3,000,000. Carl G. Lundstrom; Bernard C. Lundstrom, both of Cleveland, Ohio; Frank Jackson, Dover, Delaware. Principal office, with the Capital Trust Company of Delaware, Dover, Delaware. To manufacture and deal in any and all kinds of automobile accessories and supplies of all kinds.

Miles Tire & Rubber Co., October 1 (Ohio), $10,000. H. J. Alperin; R. P. Johnson; F. B. Burch; Ray C. Fulmer; M. S. Simpson. Principal office, Cleveland, Ohio. To deal in and repair tires and tubes.

New Process Rubber Co., Inc., The, November 12 (Delaware), $200,000, and 10,000 shares of common stock, no par value. T. L. Croteau; M. A. Bruce; A. M. Hooven, all of Wilmington, Delaware. Principal office, with the Corporation Trust Company of America, duPont Bldg., Wilmington, Delaware. To manufacture and deal in rubber, rubber tires, rubber cement, and all goods of which rubber is a component part.

Paramount International Rubber Co., November 14 (Delaware), 25,000 shares without nominal or par value. T. L. Croteau; M. A. Bruce; A. M. Hooven, all of Wilmington, Delaware. Principal office, with the Corporation

Trust Company of America, duPont Building, Wilmington, Delaware. To manufacture and deal in rubber, and automobile tubes and tires, and rubber goods of all kinds.

Premier Rubber Co., November 16 (New York), $5,000. Irving Paulson; Sarah Glickman; A. H. Marx, all of 198 Broadway, New York City. To make rubber mats.

Riddock Rubber Corporation, October 22 (Massachusetts), $250,000, and 2,500 shares of common stock, no par value. Charles M. Riddock, president, 17 Hemenway street, Boston, Massachusetts; C. Clifford Pierce, treasurer and clerk, Rochester, Massachusetts; Stella Levens, Chelsea, Massachusetts. Principal office, Malden, Massachusetts. To make, purchase, and sell rubber boots and shoes and all goods of which rubber is a component part and to do a general manufacturing and merchandise business.

The Rubber Trade in the East and South

Manufactured Goods

Manufacturing activity temporarily undergoes some abatement as the turn of the year approaches, in the interest of the inventories. However, some improvement is discernible at the present time, particularly in tires and footwear. In all lines production is in very good seasonal volume and the outlook propitious for the coming year.

Tire production with certain of the larger plants is progressing on enlarged schedules over a month ago. There is a noticeable tendency among the smaller manufacturers to add lines of second quality tires under stress of competition. Costs are being cut by resort to the high powered accelerators operative at low temperature, thus curtailing both time and steam required for curing.

In mechanical lines the factories are steadily engaged on standard goods at competitive prices. Molded and other specialties related to automobile construction are in active production. Footwear lines are proceeding on liberal to full capacity tickets in preparation for the demand early in 1924.

Heels are keenly competitive as regards new shoe equipment. Production for the repair trade maintains a large and increasing volume on close margin of profit. Insulated wire plants are actively engaged and are well supplied with orders. Automobile topping plants are busy to meet the requirements of the high rate of car production. Weatherproof clothing, druggists' sundries and specialties are all in active seasonal production.

Devine Acquires Diesel Oil Engine

The J. P. Devine Co., Buffalo, New York, specializing in the manufacture of chemical apparatus, vacuum drying and evaporating equipment, etc., has recently concluded arrangements with Vickers-Petters, Limited, of Ipswich, England, for the sole manufacture and sale in the United States and its dependencies of Vickers-Petters semi-Diesel oil engines. This particular type of equipment, as designed by a leading British concern, contains many new features, and preparations for the immediate construction of these engines, in sizes from 25 to 510 b. h. p., are being made by the Devine organizations. New York City offices are at 50 East 42nd street.

New York

Following the recent consolidation of the interests of the Paramount Rubber Co., Inc., Little Falls, New Jersey, and the Hodgman Rubber Co., Inc., 25 West 43rd street, New York, N. Y., James A. Roberts becomes vice president of the Hodgman organization and a member of the executive committee. His brother, Fred T. Roberts, now takes charge of all experimental and development work maintained by the combined Paramount and Hodgman interests.

The Wishnick-Tumpeer Chemical Co. has now established its eastern headquarters at 130 44th street, Brooklyn, New York, where it is carrying a complete stock of chemicals, oils, and pigments used by the rubber trade. David Tumpeer becomes office manager, while E. A. Johnson, formerly connected with the National Aniline & Chemical Co., is in charge of the rubber division maintained by this eastern branch of the Wishnick-Tumpeer organization.

The following officers of the Rubber Trade Association were elected for the ensuing year at a meeting held on November 1: Charles T. Wilson, president; H. A. Astlett, vice president and secretary; R. L. Chapman, treasurer. J. T. Johnston, Thomas A. Maguire and H. A. Astlett were elected members of the board of directors.

Albert Boecler, inventor of the solvent recovery system sold through the Benzene Condensation Co., is a visitor in this country from Malmö, Sweden. He is here in a consulting capacity, and with more than thirty years' experience in rubber manufacturing is well qualified to make recommendations for the recovery of the different solvents used. Recent tests made with the improved apparatus show as high as eighty-five per cent gasoline recovery.

The Tucker Rubber Corporation, Buffalo, New York, recently secured part of the plant of the United States Rubber Reclaiming Co., also in Buffalo, and will engage in the manufacture of mechanical rubber goods and other materials in which rubber is a component part. W. F. Timme is the company's corporate representative, his offices being at 350 Madison avenue, New York, N. Y.

William H. Scheel, dealing in gums, driers, and various chemicals and supplies for the rubber trade, has recently moved his offices to 179 Water street, New York, N. Y. The old quarters at 159 Maiden Lane will for the present be retained for storage purposes.

F. C. Thorn, formerly connected with the Manhattan Rubber Manufacturing Co., Passaic, New Jersey, has been recently appointed chemist of the Garlock Packing Co., Palmyra, New York.

The Bison Tire Co., 1006 Main street, Buffalo, New York, has been recently incorporated for the purpose of distributing truck and passenger car tires and tubes, accessories, etc. The officers of the company are: Rudolph B. Flershem, president; Max Becker, vice president; A. F. Osborn, secretary; George L. Mathewson, treasurer, and Seymour Waterfall, general manager. At present the organization is distributing Dunlop tires exclusively.

Eastern and Southern Notes

About January 1, 1924, all the departments of the Quaker City Rubber Co. will be moved from their present location at 624-628 Market street, Philadelphia, Pennsylvania, to the company's factory at Wissinoming, a suburb of northeastern Philadelphia. Large and commodious quarters have been provided, the plan being to bring the main executive and factory departments into closer touch. It is believed that increased efficiency will result from the change. The company specializes in the production of "Quaker" tires and a varied line of mechanical rubber goods.

At a special meeting of the board of directors of the Pennsylvania Rubber Company of America, Inc., Jeannette, Pennsylvania, held November 6, George W. Daum was elected vice president. Mr. Daum has been connected with the organization for over fourteen years, serving successively as cost manager, general superintendent, and assistant general manager. The company's executive personnel now includes: Herbert DuPuy, chairman of the board; Charles M. DuPuy, president; Seneca G. Lewis, vice president and general manager; George W. Daum, vice president; and A. H. Price, treasurer.

H. W. Butterworth & Sons Co., Philadelphia, Pennsylvania, manufacturer of hydraulic presses, drying and bleaching machinery, etc., has recently opened a branch office at 900 Woodside Building, Greenville, South Carolina. At this new department, which will render a still more efficient service to the textile industries of the South, are to be kept complete plans of practically every Butterworth finishing machine ever installed in that section of the country. The new branch is in charge of J. Ebert Butterworth, treasurer of the organization, assisted by J. Hill

Zahn, who has been connected with the company for a number of years.

H. W. Streep is now associated with The Cord Tire Corporation, whose general sales offices are in the Martin Building, Pittsburgh, Pennsylvania. Mr. Streep will have charge of the New England territory.

The Pine Tree State Rubber-Heel Co., Sabattus, Maine, has been recently installing new equipment which will practically double the plant capacity. In order to take care of new and increasing business the company's executive personnel has been enlarged by the appointment of R. W. Philbrook as sales manager. Mr. Philbrook, who was formerly in charge of the rubber heel and sole department of the Hood Rubber Co., Watertown, Massachusetts, will particularly devote his attention to extending Pine Tree State company's sales throughout the West.

On October 25, 1923, John B. Strongmand and Artemas C. Townsend were appointed temporary receivers of the Manhasset Manufacturing Co., Putnam, Connecticut. The Connecticut appointment was recently made permanent, and it is understood that the Massachusetts appointment will become so later. The Manhasset company has been manufacturing tire fabrics and yarns.

A new hydro-electric plant, consisting of two 1,500 h.p. units, and replacing an older water power system, has been recently installed at the factory of the Salmon Falls Manufacturing Co., Salmon Falls, New Hampshire. The company's product includes carded and combed tire fabrics. A. Russell Atwater is assistant treasurer.

The Rubber Trade in New Jersey

Manufactured Goods

The rubber industry in Trenton has undergone a big change for the better during the past few weeks and all branches of the trade are now beginning to boom. The sudden change was surprising and now gives hope of a better winter than was expected. Although August and September are naturally dull months, it looked for a time as though October would fall behind in production. Then orders began to be received and some of the plants found it necessary to increase the working force and working hours. Not only the tire and mechanical branches began to pick up, but there was also a notable improvement in the production of hard rubber goods. The boost in the latter product was due to the increased demand for radio parts and battery jars. Tire prices went up and down during the month, some of the concerns raising the prices on certain large sizes and lowering them on Ford sizes. Tire dealers also report a cut in the prices of tires manufactured outside of Trenton. Belting and hose departments show big signs of improvement. Manufacturers in general are now of the opinion that the winter will be a fairly good one for all branches of the trade.

Trenton

The Thermoid Rubber Co. reports an increase in production in both tires and mechanical goods. The company has opened another branch in Philadelphia, Pennsylvania, selecting 114 South Second street as the second branch in that city. S. H. Lyon is in charge of the latter branch.

The Murray Rubber Co. is experiencing a very busy season after a dull summer and is now operating twenty-four hours a day in the belt, hose and tire departments. The company found August and September dull months, but October showed big gains, an increase of about 30 per cent over the two summer months, and about 25 per cent better than during September.

The Ajax Rubber Co. reports business as being a little better. William W. McMahon, general manager, says he believes business is going to show improvement from now on and that the coming year will be a good one. In busy seasons the Ajax company's output is about 50,000 tires a month.

Both the United & Globe Rubber Co. and the Globe Rubber Tire Manufacturing Co. announce an increase in business and a larger production than during September. These increases were mainly in the tire department and the rubber hose plant.

John A. Lambert, treasurer and general manager of the Acme Rubber Manufacturing Co., has been appointed a member of the committee to secure subscriptions for a memorial to the late General Lewis T. Bryant, State Commissioner of Labor for twenty years. Philip Bird, one of the receivers of the United & Globe Rubber Corporation, is also a member of the committee.

A. LeRoy Jemison and Bergen S. Post have opened a tire establishment in the First-Richey Building, and are handling Goodyear, United States, Miller and Goodrich tires.

The United Clay Mines Corporation, Trenton, New Jersey, is now specializing in the production of high grade clays of every kind and for many different purposes, including rubber compounding. Clay mines are being maintained by this company in various sections of the United States as well as abroad. Executives of the United Clay Mines Corporation include: George C. Crossley, president and general manager; C. C. Engle, sales manager; M. C. Hendrickson, eastern sales manager; Herbert A. Miles, Western sales manager; and Archer Coddington, mines manager.

William B. Blodgett, who removed from Trenton to Los Angeles, California, two years ago, has returned to Trenton to live. Mr. Blodgett is connected with the United & Globe Rubber Manufacturing Co.

Charles E. Stokes, president of the Home Rubber Co., has been appointed by Vice Chancellor Buchanan as receiver for the Duncan Mackenzie Sons Co. He will continue the business for two months and issue the necessary certificates for the transaction of the firm's business.

New Jersey Notes

Charles M. Dilts, superintendent of the New Jersey Rubber Co., Lambertville, who has been in poor health for some time, has gone to Florida where he will spend the winter.

In a recent trade publication it was incorrectly stated that a receiver had been appointed for the Maywald Rubber Co., Nutley, New Jersey. According to Frederick J. Maywald, president of the organization, there is no truth in the report. The company is engaged in the production of gloves, tubing, inner tubes, and various specialties.

The Vulcanized Rubber Co., Morrisville, Pennsylvania, near Trenton, manufacturer of hard rubber goods exclusively, announces a greater volume of business. The company is working on large orders for various parts for radio apparatus.

The Spartan Rubber Co., Yardville, continues busy. The plant has not been in full operation because of a defect in one of the boilers. After the repairs were made another shift was put on and the plant is now running night and day.

An involuntary petition in bankruptcy has been filed in the United States District Court against Samuel and Tillie Liebstein, trading as T. B. Liebstein, and also as partners trading as The Rubber Machinery & Equipment Co., 72 Chestnut street, Newark. The petition was filed by three creditors claiming $7,000.

The Wids Rubber Heel Company of New Jersey maintains offices at 217-19 High street, Newark, New Jersey, and is engaged in the manufacture and sale of footwear, rubber heels, etc. Harry B. Watson, John K. Woods and John W. Ruef were the incorporators.

The Rubber Trade in Massachusetts

Manufactured Goods

Following the two quiet months of August and September an increased activity has developed, more noticeable in November than October, which now seems to forecast a satisfactory last quarter year in most lines. The improvement has even extended to tire production, most schedules having been somewhat increased in response to better automobile sales following deliveries of the 1924 models and the long driving season this year.

Good weather is maintaining building operations and insulated wire demand, but hurting the weatherproof clothing and rubber footwear business. Production of automobile topping and artificial leather reflects that of automobiles, which is increasing in anticipation of the 1924 season. High cotton prices are resulting in wide usage of coated burlap for the decks of closed cars.

The hard rubber trade is improving, and also some divisions of mechanical rubber goods. Spottiness as to various lines of mechanicals and competitive prices continue, however. Rubber footwear production continues fair but is not quite as active as has sometimes been the case at this season. Heel and sole production, even at highly competitive prices, has decreased considerably in response to the slacking off of leather shoe manufacture, due largely to the buying reluctance of retailers who cannot or will not adjust themselves to two seasons.

Boston

Following the annual meeting and election of officers of the Associated Industries of Massachusetts, held late in October at the Copley Plaza Hotel, the rubber industry is now represented on the executive committee by William L. Pitcher, superintendent and director, Easthampton Rubber Thread Co., Easthampton; and George S. Woodward, factory manager, American Rubber Co., division, United States Rubber Co., Cambridge. Frederic C. Hood, treasurer and general manager, Hood Rubber Co., Watertown, continues *ex-officio* a member of the committee.

Leroy C. Holbrook, since 1916 Boston representative of the J. Frank Dunbar Co., crude rubber brokers, New York, N. Y., has severed his connection with that firm to become assistant treasurer of Ceylon Rubber Products, Inc., American agents for Mayow patent plantation-molded soles, 166 Essex street, Boston. Mr. Holbrook's crude rubber experience covers nearly a quarter of a century, as he was for many years, beginning in 1899, connected with the well-known Boston firm of George A. Alden & Co. as shipper, sampler and salesman. He enjoys a wide acquaintance in the rubber trade of New England, and is past master of the Norfolk Union Lodge of Masons, in the town of Randolph, near Boston.

L. C. Holbrook

A corporation to be known as The Miller Rubber Co. of New England has been recently organized with a capital of $75,000 for the purpose of selling merchandise manufactured by The Miller Rubber Co., Akron, Ohio. The offices of the new concern are at 863 Boylston street, Boston. One of the four incorporators is Nelson P. James, who will act as president and treasurer.

The $15,000,000 damage suit of George F. Willett, of Willett & Co., formerly Willett, Sears & Co., against Boston bankers is now being heard in the Superior Court at Dedham. Among the associated companies of this firm is the Boston Belting Co., control of which Mr. Willett lost but later regained. Other associated companies were the American Felt Co. and the Roxbury Carpet Co. The latter firm in 1917 purchased from various owners 5,000 shares of the Boston Belting Co. stock at $132 a share.

C. A. Damen, who has been connected with the sales department of L. H. Butcher Co., Inc., 239 Front street, New York, N. Y., for four years, has been assigned to the Boston office and will call on the New England trade.

The Rheabat Corporation, 77 Summer street, with a factory at East Pepperell, is spinning rhea fiber into yarns which are claimed to be a cheaper and equally satisfactory substitute for cotton and linen yarns. Rhea fiber yarns are said to have many times the tensile strength of cotton and to be more flexible than linen. Several rubber goods manufacturers are experimenting with the yarn.

Massachusetts Notes

Judge Wait in the equity session of the Superior Court has appointed Arthur H. Morse, of Weston, a Boston lawyer, as permanent receiver of the George Grow Tire Co., Canton Junction, on the petition brought by John W. Clark, of Providence, Rhode Island, holder of a protested check from the Grow company for $1,600. The proceedings were unopposed.

The court ordered that such attachments as have already been brought against the company by several large creditors are to stand.

The petition for a receiver states that the company's plant, including real estate, buildings, machinery and equipment, is carried on the books for a value of more than $600,000; that the company has in addition raw materials, consisting of rubber, fabric, merchandise in process of manufacture, and finished tires carried on the books as of August 31 last at a valuation of more than $400,000; that it has cash, notes and accounts receivable for more than $200,000.

The liabilities are unknown, but thought to be more than $250,000. There is also a large contingent liability, unknown in value. Outstanding stock is said to total $1,264,440.

The Monatiquot reclaiming division of the Stedman Products Co., South Braintree, is running to full capacity with sales for future deliveries far above normal, and it is felt that the present situation in the tire and heel industries will result in a large increase in the use of reclaimed rubber. The flooring division is also working night and day on capacity orders for Naturized flooring. The firm expects shortly to introduce to the trade some new brands produced under radically different methods. Following a pleasant custom inaugurated over ten years ago, all employes of the company again received their Thanksgiving turkey this year.

The International Cotton Mills, 24 Federal street, Boston, has discontinued the manufacture of tire fabric at its Lowell plant, and is now installing at that plant a number of looms for the manufacture of wide sheetings. George O. Dexter is agent for the Lowell division.

The Rubber Trade in Ohio

Manufactured Goods

Conditions in the Ohio rubber trade, with the exception of tire departments, seemed comparatively satisfactory to the leaders of the industry during the latter part of the past month. Tire production has been gradually increased to meet increased demand because of the spring dating business which is either already under way or anticipated, and while prices are at a low record resulting in the absence of profits to a large extent there seemed to be little chance of their going lower. Therefore, improved stability was noted in the situation just passed through when the scale of prices was constantly downward.

It is conservatively estimated at the present time that production of automobile tires in the Akron district is in the neighborhood of 50,000 tires a day and that an increase of 10,000 may be anticipated during the next few months.

During the early part of the month there was some revision downward in the price of solid tires but the companies which made these revisions followed the now accepted policy of making no public announcements so that the last of the downward revisions did not adversely affect the industry.

The boot and shoe business is very good, according to all reports, and another record season is expected. Four-buckle gaiters and especially novelty patent gaiters with patent clasps continue to be in great demand and the supply is not sufficiently large to supply it. Therefore apportioning of output has been resorted to in some instances to make distribution equitable.

Mechanical goods production is reported at from 65 to 75 per cent of normal throughout the district and to be increasing gradually. Price revisions in these departments during the past year have brought profits to low points but on the whole this phase of the business is characterized as satisfactory.

In the reclaimed rubber factories it is stated that business is good and that while improvement would be appreciated the present does not give cause for complaint. The druggists' sundries business is fairly active.

On the whole the rubber industry continues its normal course without much fluctuation. Outside of the development of the air ship division of the Goodyear company recorded below the month was without any outstanding features in any part of the industry.

Zeppelin Rights Purchased by Goodyear

Recent announcement has been made regarding the formation of the Goodyear-Zeppelin Co., as a subsidiary to the Goodyear Tire & Rubber Co., and organized to take over for this country all the rights, patents, drawings and designs of the Zeppelin Co. of Germany relating to rigid airships. The new concern, which will be American owned and controlled, will have exclusive rights to all Zeppelin patents, equipment, etc., for North America except Canada and non-exclusive rights in Canada. The Zeppelin company has received no cash in the transaction, its future interests being in the form of minority holdings which it will receive for its experience, patents, trade secrets, processes, etc. This minority interest will assure it an equitable share in the results of the industry, which both organizations claim is on the eve of a great development.

The Goodyear company's active interest in aeronautics dates back to 1910, when studies were made in Europe regarding the manufacture of aircraft fabric, while during the war through the construction of dirigibles for the army and navy it became the largest manufacturer of lighter-than-air craft in the country. It is planned to continue this construction work at Akron through extensions and additions to the present Goodyear laboratories and workshops, while through the formation of the Goodyear-Zeppelin Co. America will be able to take advantage of any other inventions and improvements made by the parent Zeppelin company or its other corporations that are established in various parts of the world.

Akron Rubber Reclaiming Co.

The Akron Rubber Reclaiming Co., Barberton, Ohio, has been recently organized as an Ohio corporation, with a capital stock of $500,000, of which $250,000 is to be issued at once. The principal office and factory will be at Barberton, the concern having acquired the property and holdings of the Barber Cement Block Co. A full line of reclaimed rubber will be manufactured and sold by the new organization. The incorporators are as follows:

William O'Neil, vice president of the General Tire & Rubber Company; R. M. Pillmore, president of the Mohawk Rubber Co.; C. W. Seiberling, vice president of the Seiberling Rubber Company; J. M. Alderfer, president of the India Tire & Rubber Company; B. O. Ettling, president of the Ettling Lumber Company, Barberton, Ohio.

The officers and directors are as follows: B. O. Ettling, president; William Welch, vice president and sales manager; C. E. Bishop, vice president and factory manager; R. M. Pillmore, secretary and treasurer; C. W. Seiberling, director; William O'Neil, director; J. A. Christie, director; J. M. Alderfer, director.

Mr. Welch was formerly for seven years connected with the Goodyear organization; Mr. Bishop has been associated for twenty years with the rubber industry, having also been connected with the Goodyear company for the past twelve years. Mr. Christie is factory superintendent of the Star Rubber Co., Akron, Ohio.

Akron

White & Co., maintaining offices at 602-603 Flatiron Building, Akron, Ohio, and specializing in rubber material and equipment, announce the recent purchase of a partnership in the concern by C. W. Seiberling, Jr., and the consequent change of the company's name to White, Seiberling & Co. Mr. Seiberling has had much experience in the rubber industry both in this country and in the Far East in his previous association with the Goodyear organization. His latest connection has been with the Seiberling Rubber Co., Barberton, Ohio, which company he is leaving to take up his new work.

The Kelly-Springfield Tire Co. is now operating with approximately 700 men following reopening of its Akron plant two months ago. The company closed this factory plant early last summer and concentrated all production at Cumberland, Maryland, to which the company moved its headquarters several years ago. It is reported semi-officially that production of tires will be increased to approximately 2,000 tires a day by the end of the year. Additional forces are gradually being added by the company here.

Miller Rubber Co. toy jobbers and distributers spent several days in Akron early in November studying factory and business conditions from the rubber city viewpoint. The Miller Rubber Co. has gradually augmented its toy department during the past two years, and reports this department of its business still gradually increasing.

William A. Maguire has succeeded Frank L. Barnwell as direct Akron representative of the Jenckes Spinning Co., following promotion of Barnwell to general tire fabric sales manager with headquarters at 57 Leonard street, New York, N. Y. Mr. Barnwell was located in Akron five years and will continue to call on some of the trade in this territory, according to reports.

Following the resignation of C. C. Schultz, president of the Rubber Products Co. of Barberton, John B. Chisnell has been named general manager. Joseph Johnston, son of W. A. Johnston, founder of the business, who retired as president last year, has been named chairman of the board of directors.

The Houk Rubber Co., Akron, has been formed with a capitalization of $500 by H. L. Houk, formerly with the American Tire & Rubber Co. and H. L. Arbogast, formerly chemist for the company. The purpose of the new company has not been announced.

J. R. Bailey and H. W. Limert have formed the Akron Rubber Mat Co. with a capitalization of $2,000, for the distribution of rubber mats to be made under contract. The company plans eventually to build a factory.

Action brought by a stockholder to have a receiver appointed for the Northern Rubber Co., Barberton, was dismissed by the Common Pleas Court. The company purchased the former Biltwell Rubber Co. plant in Barberton early last spring. Louis Schott, organizer and former head of the Amazon Rubber Co. is president of the Northern Rubber Co.

The Century Rubber Co., Wadsworth, has increased its capitalization $25,000. The company manufactures rubber balloons and other rubber novelties and specialties. Dr. M. W. Everhard is president of the company and Hayes Darbey is secretary and treasurer. John Miller of Ashland, Ohio, is general manager.

D. W. Warden, a man of much experience in the rubber industry, and at one time assistant treasurer of the Firestone Tire & Rubber Co., Akron, has been recently appointed credit manager of The Dayton Rubber Manufacturing Co., Dayton.

With increasing demand for its products, which include surgeons', household, and electricians' gloves, The Wilson Rubber Co., Canton, is now building a five-story steel and concrete addition to its plant, this being the fifth factory enlargement since the organization of the company seven years ago. Executives include: John S. Willis, president; Fred J. Wilson, vice president and general manager; and Wendel Herbruck, secretary and treasurer.

Although because of bankruptcy the plant of The Tuscora Rubber Co., Dover, is to be sold, a plan is under consideration whereby the creditors may effect a reorganization. V. J. Robinson is receiver.

The Buckeye Rubber Manufacturing Co., Willoughby, successor to The Buckeye Rubber Products Co., and specializing in the production of "Polack" truck tires, and mechanical and molded rubber goods, has recently under the name of "Buckroid Products" added a new line to its output, consisting of matting, stair treads, etc., of several differing types. "Buckroid" is said to represent one of the toughest forms of vulcanized rubber made.

Ohio Notes

The Hubbell Rubber Co., Zanesville, Ohio, which recently purchased the Rotary Tire & Rubber Co., is now enlarging the plant with a view to turning out 700 tires and 700 tubes a day. Two sizes of casings will be produced: the Hubbell Super-Tread Cord, which is extra oversize, and the Wells cord tire, representing the company's Junior line. The executive personnel of the Hubbell organization includes the following: Charles C. Hubbell, president and general manager; E. C. Shaner, vice president; E. E. McCloud, secretary; and J. C. Rehl, treasurer.

Harry F. Webster, secretary and factory manager of The Denman-Myers Cord Tire Co., Warren, Ohio, has been recently appointed general manager. Mr. Webster's previous associations were with The Goodyear Tire & Rubber Co. and with The Firestone Tire & Rubber Co., of Akron. He is succeeded as factory manager by P. R. Manahan, who has been serving the company as chief chemist. Another change includes the appointment of A. J. Martin as assistant sales manager, Mr. Martin having formerly held the position of advertising and sales promotion manager with the organization. He will continue to supervise this work in addition to his new duties.

Contracts have been recently let for an enlargement of the plant of the Oak Rubber Co., Ravenna, Ohio, the new construction to furnish over 5,000 square feet of additional floor space. In this new section, which comprises another floor, the company's enlarged offices will be located, while additional machinery and equipment will also be installed. The company's line of products includes plain and novelty rubber toy balloons.

H. C. Buchanan, formerly connected as superintendent with the Kelly-Springfield Tire Co., is now general superintendent of the two factories maintained by The Studebaker-Wulff Rubber Co. at Carey and Marion, Ohio. At the former plant, where Herman Besaw is local superintendent, about 100 tires a day are being produced, while the output at the Marion factory, where Richard W. Miller is in charge, averages five hundred casings and one thousand tubes a day.

Following instructions from the Court the plant of The Lake Shore Rubber Co., Wellington, Ohio, is being operated by W. E. Boyd, receiver, until the sale of the property has been consummated. The company's products included toy footballs and balloons, and various rubber sundries.

During October the general offices of the Fidelity Tire & Rubber Co. were removed from Chicago, Illinois, to Massillon, Ohio, where the company's plant is located. Factory operations have been carried forward during the last two months at maximum capacity, and this schedule is to be continued through the winter. George C. McConnell is factory manager, and C. E. Pumphrey is in charge of operating and sales.

The Thomas Rubber Co., which recently purchased from the Kelly-Springfield organization its Wooster, Ohio, plant, is now engaged in the manufacture of cord tires. A recent addition to the executive personnel includes the appointment of C. G. Graham as sales manager.

The production of equipment under the name of Triplex Mixers, as formerly manufactured by the Cleveland Liner & Manufacturing Co., Cleveland, Ohio, has now been taken over by the Banner Machine Co., of Columbiana, Ohio. The latter organization also intends to put out a full line of agitators and mixers.

The Tuscan Tire & Rubber Co., Carrollton, Ohio, is now manufacturing approximately 300 tires a day, and in addition a line of druggists' rubber sundries. "Tuscan" and "Buckskin" cord and fabric tires, as well as inner tubes, represent the company's specialties.

Robert L. Shepherd has been recently appointed advertising and sales promotion manager for The Mansfield Tire & Rubber Co., Mansfield, Ohio.

The Rubber Trade in the Midwest

Midwest Rubber Manufacturers' Association

There was an unusually large attendance at the regular monthly meeting of the Midwest Rubber Manufacturers' Association which was held November 13 in the rooms of the Old Colony Club, Hotel La Salle, Chicago, Illinois. Thomas Follen, president of the association, presided at a round table discussion following the luncheon, where opinions seemed to indicate that conditions in the tire industry were showing some improvement.

A committee was appointed to express the desire of the organization for the abolition by Congress of the 5 per cent war tax on automobile tires. J. B. Gabeline, president of the Standard Four Tire Co., was made chairman of this committee, which will draft the association's petition and present it at Washington, D. C.

The next meeting of the association will be held December 11, 1923.

Midwestern Notes

Van Cleef Bros., manufacturing chemists, Woodlawn avenue, 77th to 78th streets, Chicago, Illinois, report that sales for the fiscal year which closed October 31, are 30 per cent greater than for the year preceding, while the production tonnage during the last twelve months has been the greatest in the history of the country's business. Recently two additions have been made to their sales staff: Harry J. Johnson, who will represent the organization in Ohio, West Virginia, western New York, and western Pennsylvania; and William B. Dean, who will have the territory extending south from Kansas City to Texas, inclusive.

Executives of The Blekre Tire & Rubber Co., Midway District, Saint Paul, Minnesota, report an increase in the volume of business, following the general stabilization of conditions in the Northwest. Upon this section of the country the Blekre organization plans to concentrate its efforts, believing it wiser to utilize immediate trade territory rather than to attempt national distribution. In the future the company will manufacture cord tires exclusively, as well as a line of battery boxes. A change in the company's executive personnel includes the appointment of E. L. Larson as superintendent.

With a steady production throughout the year, the Corduroy Tire Co., Grand Rapids, Michigan, is now operating both day and night. The company's sales up to October 1 were more than 75 per cent greater than those for a similar period during the year previous, while sales for the month of October alone

were more than 100 per cent in advance of those for October, 1922. L. A. Brown is president.

Executives of the Hodgman Rubber Co., 25 West 43rd street, New York, N. Y., state that Stephen A. Douglas has been recently appointed as the representative of their company's interests at Detroit, Michigan, where he will handle topping material as used by the automobile trade.

J. P. Egan, formerly connected with the Goodyear and Denman-Myers organizations, has been recently appointed by the Mohawk Rubber Co., Akron, Ohio, as manager of its Chicago branch.

J. H. Appleby, who has been serving The Denman-Myers Cord Tire Co., Warren, Ohio, as one of its district managers, has been recently appointed Western division sales manager with headquarters in Chicago, Illinois.

Howard William Makley, formerly connected with the Brunswick-Balke-Collender Co., is now associated with The General Tire & Rubber Co., Akron, Ohio, in the capacity of traveling representative, with headquarters at St. Louis, Missouri.

The Rubber Trade on the Pacific Coast

Manufactured Goods

In contrast with many eastern concerns, factories on the Pacific Coast, with only minor exceptions, report automobile tire and tube production much greater than a year ago. The price reductions account for a fair degree of the decrease, and attractive terms offered distributors by some coast manufacturers explain some of the sales, but the chief factor has been the automobile itself. This is strikingly evidenced in the recent passenger car and commercial vehicle registrations. In California alone these totaled 22,279 for October, 1923, as compared with 14,158 for October, 1922, a gain of 57 per cent.

There has been a notable slackening in many places of motorcycle tire sales. In the State of Washington, for instance, 259,454 automobile licenses were granted for the year ending October 1, 1923, as compared with 213,454 for a similar period a year before, a gain of 21.55 per cent; but there were 129 fewer motor cycle licenses issued this year than last, and dealers decreased from 24 to 10.

According to the report of the Federal Reserve Bank of San Francisco, dated October 16, production of Pacific Coast industries continued large and distribution wide, but the total volume of wholesale and retail business was smaller for September than for any previous month in 1923, although 10 per cent above that of September, 1922. It is remarked, however, that the rubber industries of the Coast scored a much higher general average than most of the others making reports in the same period.

Outside of tires, tubes, and automobile rubber accessories, the most activity has been in mechanicals used in the building trades. Trade in insulated wire has been especially good, but there has been of late a noticeable slowing up in sales of belting, packing, and allied goods, due, it is believed, to excess purchases a short time ago. New goods of rubber are being actively pushed by Coast branches of eastern concerns, as for instance, hard rubber tubing which many large chemical concerns are being induced to use instead of metal tubing, and for which, it is said, there is a good but hitherto neglected market. The rubber shoe and clothing trade finds business above normal, but much better than a year ago despite the delayed rains. Sales and orders for druggists' sundries are said to be unusually good.

Los Angeles

The Western Auto Supply Co., the largest tire distributing concern in the West, handling over seventy-five carloads a year, has just opened its new headquarters, Grand avenue and Eleventh street. George Pepperdine, the president of the company, which has eighty stores, started the business fourteen years ago with an admitted capital of $5. The new building is four stories high and has over two acres of floor space.

The Goodyear Tire & Rubber Co. of California reported that October just past was the best in the company's history in point of sales. Mid-month production for November was a daily average of 3,855 casings and 4,400 tubes, a large proportion being sizes over 30 by 3½. Vice President and General Manager A. F. Osterloh, while in touch with factory affairs, is still unable to visit the works. He is convalescing from an operation for mastoid abscess, but expects to be actively "on the job" by January 1.

A 16-hour a day working schedule is now in force at the factory of the Samson Tire & Rubber Corporation, Compton, according to President Adolf Schleicher, who also expects that the works will have to be operated for twenty-four hours a day by January 1 to meet the heavy demand for its products. The company, the first to make cord tires on the Coast, has broken ground for new factory units and is making track extensions for doubling the capacity of the plant. A considerable amount of equipment recently bought by Mr. Schleicher on an eastern trip will be installed. Over 50,000 square feet of additional floor space will be provided. A large extension to the works was completed early in November.

H. D. Ferguson, who since 1919 has been factory manager of the Iowa Cord Tire Co., Des Moines, Iowa, has recently resigned his position and removed to Los Angeles in order to take charge of his company's sales on the Pacific Coast. Before beginning his present duties Mr. Ferguson was associated with the Hartford Rubber Co., and later with the Fisk Rubber Co.

The Coraja Rubber Co., 111 North Western avenue, Los Angeles, California, has been recently incorporated with a capital stock of $150,000. Under the name of "Coraja" the company manufactures a patented product, and also a Pantasote top patch. The organization has no connection with the Coraja Rubber Manufacturing Co., Dallas, Texas, having purchased from that company the patent right to manufacture Coraja. Incorporators of the California organization include: Ralph I. Guy, president; Robert A. Duffy, vice president, and L. B. Rice, secretary and treasurer.

A new specialty being turned out by the E. M. Smith Co., manufacturer of rubber belting, etc., Clarence street, Los Angeles, is a radiator hose molded in standard lengths of rubber, fiber, and asbestos so as not only to eliminate plies but to stand maximum abuse from oil and hot water.

Pacific Coast Notes

E. F. Norton has been appointed general manager of the Spreckels "Savage" Tire Co., San Diego, vice R. V. Morris, resigned. Mr. Norton has appointed W. B. Mendenhall as his assistant.

Specializing in paper mill needs, The American Belting & Hose Co., 175 E. Water street, Portland, Oregon, has in a few years built up a considerable business in the Northwestern states and Canada. In addition to rubber-covered rolls, the company also makes a large variety of rubber mechanical goods. The plant is being gradually enlarged. The company has patents pending on new rolls which, it is said, will considerably enhance the production of paper mills. C. R. Griffith is president and treasurer, Franklin T. Griffith, vice president, and L. Griffith secretary and purchasing agent.

Court and financial difficulties have not to any considerable extent slowed the operations of the Coast Tire & Rubber Co., of Oakland, which is daily turning out tires and tubes nearly equal to its 600 capacity. The stockholders' protective committee is striving to straighten the company's affairs and hopes to have the receivership continued until collections from outstanding accounts equal current indebtedness. The liabilities are put at $185,000, and, it is claimed, the assets are several times that amount.

The Obituary Record

Charles Proteus Steinmetz

THE scientific world has lost one of its ablest leaders with the passing away, on October 26 at Schenectady, New York, of Charles Proteus Steinmetz. Born on April 9, 1865, in Breslau, Germany, young Steinmetz received a thorough scientific training in his native city and in Berlin, and later in Zurich, Switzerland. Emigrating to America in 1889, he at first found employment with the Osterheld & Eichemeyer Manufacturing Co., Yonkers, New York. Becoming connected with the General Electric Co., when it later took over the Eichemeyer interests, Dr. Steinmetz organized and took charge of the calculation and design of the former company's apparatus at Schenectady, New York. Interested in its research and development work, and as chief consulting engineer often in charge of extensive and intricate plans, Dr. Steinmetz served the General Electric Co. for practically thirty years, and until the time of his death.

He was the author of eleven books, all recognized as classics in their particular field, as well as contributor of many articles and scientific papers to various technical journals. His inventions were concerned largely with the transmission of power and the design of alternating-current machinery, although his researches covered a wide field of investigations. He has been called the ablest man in America in theoretical electricity, his great mathematical talents being combined with a thorough knowledge of engineering. Harvard University granted him an honorary A. M. in 1902, and Union College in 1903 an honorary Ph. D. At the time of his funeral five minutes of silence was observed at all the plants of the General Electric Co., in Schenectady and elsewhere.

Treasurer of United States Tire Co.

The rubber industry suffers a loss through the death, November 8 at the Post-Graduate Hospital, New York, N. Y., of Edward J. Hathorne, treasurer of the United States Tire Co. Mr. Hathorne, who died at the age of 69, was a native of Boston and spent much of his earlier life there, taking part in politics and serving in the State Senate. During recent years he had held important positions as director, vice president, secretary, or treasurer with a number of organizations, including the G. & J. Tire Co., the Rubber Goods Manufacturing Co., and the United States Rubber Co. He was assistant treasurer of the last-named organization from May 23, 1913, to December 31, 1917.

E. J. Hathorne

Five years ago Mr. Hathorne retired from business, and moved to Hartsdale, New York, a suburb of New York City. For fourteen years he had been a member of the Boston Cadets, and at the time of his death was an honorary member of that organization. He was also a member of the New England Society of New York; the Athletic Club of New York; and the Scarsdale Town Club. He is survived by his widow.

Long a Rubber Company Accountant

Samuel O. Barnard, who had been with the Revere Rubber Co., Chelsea, Massachusetts, thirty-five years, most of that time as an accountant, died November 8 at his home, 16 Otis street, Watertown, in his seventieth year. He was a native of Watertown, the son of John Barnard, and his ancestors were among the early settlers of that town. Mr. Barnard is survived by his wife, who was Charlotte C. Schaffer, of Cambridge; one son, Alfred M. Barnard; two daughters, Mrs. Albert F. Jewett and Miss Isabel C. Barnard, all of Watertown; and a sister, Mrs. F. B. Marshall, of Sanbronton, New Hampshire.

Rev. Ernest S. Meredith, of Watertown, read the Unitarian service at the funeral. The pallbearers, from the office of the Revere Rubber Co., were F. L. Dunker, W. H. Legg, W. H. Townsend, and E. L. Stickney.

Director of Pequanoc Rubber Co.

Executives of the Pequanoc Rubber Co., Butler, New Jersey, announce with regret the sudden death of Charles C. Hopper, who had been connected with their organization since the year 1906. Mr. Hopper had become thoroughly familiar with the reclaiming field, but was identified principally with the sales activities of his company. He had many friends in the rubber industry, both in this country and in Canada. At the time of his death he was a director and assistant secretary of the Pequanoc organization, and was also director in several other local enterprises. He was affiliated with the Ivanhoe Lodge, F. & A. M., of Paterson. He is survived by his widow and one son, Dr. Craft Hopper, of Paterson.

National Tire Dealers' Association Holds Convention

Representatives from every section of the country were in attendance at the fourth annual convention of the National Tire Dealers' Association, which was held at the Hotel Pennsylvania, from November 13 to 15 inclusive. In addition to the unusual numbers of dealers there were also present many executives from the leading tire companies, while throughout the three-day session the desire to cooperate and work with the tire manufacturers was emphasized strongly. Some addresses of much interest were given, one of these being by R. W. Davis of A. Schrader's Son, Inc., who spoke on tire valves and their functions. Another address was made by Richard Lennihan, assistant director of the Bureau of Business Research of Harvard University, who explained the school's methods for teaching pupils to meet actual business problems. W. Herman Greul, consultant in analysis of business operations, also spoke on the need of cooperation between dealer and manufacturer, and the necessity of careful study by the former of stocks on hand and consumer demands.

Among the more important proposals made at this convention by the retailers were the following:

Tires should be distributed only through dealers whose principal business is selling tires for profit.

Manufacturers should discontinue the sale of tires direct to commercial accounts. Such sales should be handled through dealers.

All spring and seasonal datings should be eliminated.

Only four tires and tubes per car should be sold to car manufacturers as original equipment.

Standardization of tire sizes is urged in order that the dealer may be permitted to reduce his stocks.

Tires should be sold to tire dealers and to car manufacturers at the same price.

Tire manufacturers should not sell tires direct to car dealers unless car dealers are willing to carry a stock.

Every effort should be made to see that tires sold for original equipment stay on the car until it reaches the hands of the user.

Sale of tires to consumers from factory branches should be discontinued.

A conference is urged every three months between a committee representing tire manufacturers and one representing tire dealers.

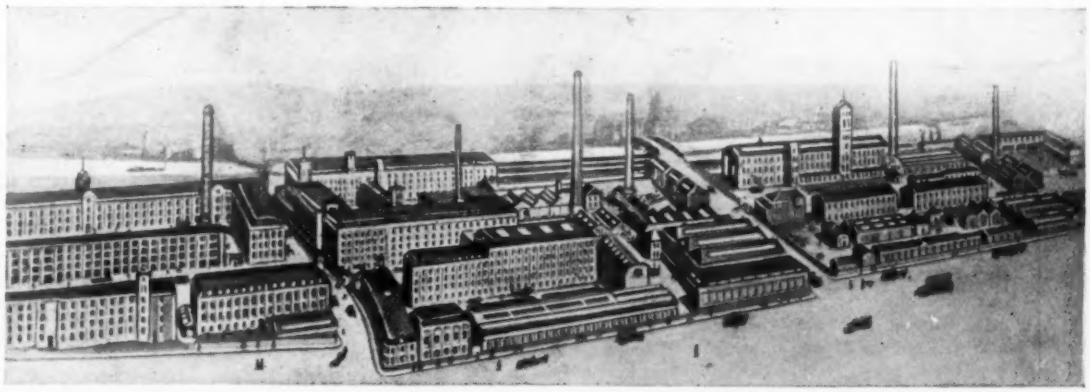
The North British Rubber Co., Limited

Founded by Americans Seventy Years Ago—Now Largest Producer of Rubber Goods in British Empire

CASTLE MILLS, the well-known factory of The North British Rubber Co., Limited, Edinburgh, Scotland, has interesting associations from the point of view of the American, for it owed its inception to the energy and sound judgment of two native-born Americans some seventy years ago.

As the manufacture of rubber shoes in the United States had become a remunerative proposition, it was figured shrewdly enough that it might pay equally well in Europe. In the autumn of 1855, therefore, H. L. Norris, of Jersey City, New Jersey, and S. T. Parmelee, of New Haven, Connecticut, both practical rubber men and representing an American syndicate, crossed the Atlantic with the object of fixing on a location that would be convenient for the launching of the rubber shoe and boot business on the other side under Goodyear patents held by William Judson, advocate, New York, N. Y.

Apparently their first objective was Glasgow, Scotland, but either owing to difficulty in finding a suitable site or to prospect of long delay, they transferred their attentions to Edinburgh, which, besides its other natural advantages, possessed to their minds the important additional one of easy access to continental markets.



Works of the North British Rubber Co., Ltd., Castle Mills, Edinburgh, Scotland

At the same time one other circumstance was decisive for their choice: they discovered in Edinburgh—almost under the shadow of that city's historic castle—what at that time was one of the finest models of a manufactory to be found in Great Britain or probably any other country, unoccupied and ready for installation. Formerly a silk mill that had proved unsuccessful, it presented itself to Messrs. Norris and Parmelee as just the right thing at the right time.

By midsummer of 1856 the factory, which consisted in the main of two large blocks of five floors each, was once more a living and pulsating entity. The venture, founded under the name of Norris & Co., with Mr. Norris as general manager and Mr. Parmelee as works superintendent, was an almost immediate success, and after about ten years employed something like 600 workers.

In 1857 the Limited Liability Companies Act came into force in Great Britain, and to enable the concern to be registered under the provisions of the new act the formal dissolution of the firm of Norris & Co. was effected. A new company with a capital of $400,000 was then formed by the same shareholders and registered under the designation the firm still retains—The North British Rubber Co., Limited.

Concurrently the company began the manufacture of belting, hose, mechanical goods and elastic web. Rubber canvas shoes—a branch which the North British Rubber Co. initiated—were introduced in the same year.

H. L. Norris was twice general manager of the company. He retired in the first case in 1860, passing over the reins of control to D. D. Williamson, of New York, N. Y., who occupied the managerial position with distinction for a period of five years. When the latter retired, Mr. Norris again took charge until the year 1871, when he was succeeded by his son-in-law, W. E. Bartlett, who was destined to make so brilliant a contribution to the annals of pneumatic tire invention.

Steady progress, alike in sales of the company's goods and in improvements in manufacture, was made for a considerable succession of years, with no sensational development, however, until 1890 when W. E. Bartlett, by that time managing director of the company, patented the first *detachable* pneumatic tire ever produced—the "Clincher" cycle tire, which not only made cycling history but pointed the way to the adoption of the clincher or beaded edge type of motor tire, which gave motoring a world-wide impetus.

Mr. Bartlett guided the fortunes of the company until his decease in 1900, his immediate successor being R. G. Stewart, of Edinburgh, who in turn retired in 1908 in favor of his assistant, A. C. Baker. Through a sudden breakdown in health Mr. Baker's term of office was limited to four years. It was in 1912, therefore, that the present managing director of the company, Alexander Johnston, J. P., a leader in the industry and a progressive type of executive, was appointed.

From the date of the introduction of the "Clincher" tire, the rate of progress and expansion of the company has been very rapid.

In 1910, the company took over by purchase the entire business and plant of The Scottish Vulcanite Co., Limited, a contiguous concern which, though established in 1861 by a number of shareholders of The North British Rubber Co., Limited, was until the acquisition by the latter quite a separate undertaking and distinct in every respect. With this and other important extensions of more recent date, Castle Mills has attained a notable development as a tire and general rubber undertaking. The factory covers 30 acres and employs 5,000 workpeople; the capital in-

vested amounts to over $4,000,000, while the business has branches and connections in every market of any commercial importance throughout the four continents.

As will be gathered from the illustration, the North British factory comprises essentially a series of three factories run as one unit. Except for the steam for presses and pans, the plant generally is electrically driven, the lighter units in groups and the larger machines, such as the heavy calenders, by individual motors.

Organized as it is for big scale production, Castle Mills turns out a heavy volume of goods annually, many of them standards of their kind. A few of the most important lines in everyday production include motor, motorcycle and bicycle tires, band tires and cab tires; rubber boots and shoes and canvas shoes; hose, belting, sheet rubber, rings, mats, rubber flooring, hot water bottles and gloves; clothing, colored sheetings, rugs, printers' blankets, golf bags; hard rubber sheet, rod, combs and molded goods; celluloid goods and golf balls.

The North British undertaking is laid out to meet the requirements of a very extensive clientele adequately and efficiently, and the general trend of future prospects indicates that this corporation is practically certain to show output progress within the next few years greatly outstripping the ratio of any past period.

Japanese Rubber Trade Notes

LATE advices indicate that while industrial destruction at Yokohama was almost complete, the damage at Tokyo was not as serious as had been feared and was due chiefly to fire following the earthquake rather than to the quake itself. Only about 27 per cent of the Japanese rubber product was manufactured in the devastated area and many of the rubber plants were only partially damaged. The particulars available regarding individual companies follow.

The Meiji Rubber Factory, Shinagawa, Tokyo, was partly damaged. It is estimated that production is cut down 20 per cent. Plenty of materials are on hand to meet requirements.

The plant of the Fuji Rubber Co., Ohi, Tokyo, manufacturers of bicycle tires, etc., was slightly damaged. It is estimated that it will take about two months to restore the factory for normal operations. There is some stock on hand for manufacture.

The Sakura Rubber Co., reports no damage to buildings but a little to machinery. The company expected to resume business about the middle of October.

The Union Rubber Co. plant was damaged only by fire. There is no stock on hand and it is not possible to say when business will be resumed.

The Central Rubber Co., Honjo Branch, Tokyo, sustained some damage to its machinery. It has no chemical supplies so cannot resume business for some time.

The Japan Bicycle Rubber Co., Tokyo, has about one month's supply of materials on hand. No lives were lost and there was no damage to machinery. The firm expected to resume business in September.

The Takasago Rubber Co., Tokyo, reports part of its warehouse damaged only, and is in position to resume as soon as materials can be secured. Tires, rubber hose, etc., are its products.

The Kojima Hard Rubber Co., Tokyo, was only slightly damaged, and expected to resume early in October. It has some stock on hand but lacks naphtha.

No news has been received from the following rubber companies: Azuma Rubber Co., Limited, Tokyo; Futabaya Co., Limited, Tokyo; Nettai Sangyo Co., Limited, Tokyo; Nippon Veneer Seizai, Limited, Yokohama; Teikoku Oxygen & Acetylene Co., Limited, Nagoya; Tokyo Gomu Kogyo Kaisha, Limited; Yonei Shoten, Tokyo; Sumitomo Densen Seizo-sho, Limited (rubber wires); Tokai Densen Kaisha, Limited (rubber wires); Teikoku Gum Seizo-sho, Limited, Tokyo. These firms manufacture rubber and rubber goods, such as balls, chests, dolls, gloves, heels, sheets, shoes, tires, tubes, valves, wires, etc.

As to business in general, there is a tendency toward an increase in general imports, owing to advances in domestic prices, but domestic prices in general are up only 10 per cent and in extreme cases only 20 per cent above pre-disaster prices, because they are governed by anti-profiteering laws.

Some 8,000 spindles and 4,000 looms have been affected by the damage to the cotton spinning industry. The production of yarn during September amounted to 140,000 bales, showing a decrease of 34,000 bales as compared with August. Exports were 22,500 bales.

Some surprise has been expressed in America at the small amount of actual buying to date on behalf of Japanese reconstruction. This will develop as soon as the Reconstruction Board decides upon the method of importation of the necessary materials and whether the devastated cities are to be rebuilt much as they were before the disaster, or whether this opportunity is to be taken to modernize them. Another vital question is whether reconstruction is to be left to private initiative or handled and financed by some specially created governmental agency.

The loans of the Bank of Japan have increased greatly owing to calls for relief, but as proper action was enforced after the expiration of the moratorium, the money market became normal and there is no fear for the credit of Japan. Commercial transactions are generally quiet except for the demand for necessities caused by the disaster. Foreign trade has been little affected, but will recover as soon as reconstruction methods are decided.

Peter F. Krevenaar, of New York, N. Y., Japanese manager of the United States Rubber Co., with headquarters in the new Marunouski building opposite the railroad station in Tokyo, is reported safe with his wife and two infant children.

All members of the Japanese staff of the Westinghouse Electric International Co. and their families are unharmed, although all had narrow escapes, harrowing experiences, and lost practically all of their belongings. The company's offices in the Takata building, Tokyo, were demolished. The staff includes D. F. Baker, manager for Japan, and F. C. Middleton and R. A. McManigal, representatives.

R. W. Hadley, representative of the Goodyear Tire & Rubber Co. in Japan, was on the second floor of a building in the business district of Yokohama with his wife and baby when the earthquake occurred. The building collapsed and they were completely buried, but by almost superhuman efforts escaped before the place burned up. All of Mr. Hadley's personal belongings were lost.

UNITED STATES IMPORTS OF HARD RUBBER GOODS

The bulk of the hard rubber goods imported into the United States comes from Austria and Germany, while small quantities are also sent by England, France and Canada. During the first nine months of 1923, the total imports of these goods amounted to 176,110 pounds, value $183,173, of which Austria supplied 85,177 pounds, value $75,545, and Germany 89,234 pounds, value $104,622.

THE ANCHOR CHEMICAL CO., LIMITED, CLAYTON LANE, Manchester, England, a leading British manufacturer of chemicals for the rubber trade, has recently made some additions to its directorate, the new members including the following: J. E. Hewlett, T. Martin, A. Reid and T. Taylor. The founder of the business, T. R. Hewlett, will continue to act as chairman of the organization, while he and T. Harry Hewlett will be the managing directors.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Now that the Prime Minister has expressed himself in favor of protection as a panacea for our widespread industrial unemployment, there is naturally much jubilation in many circles, though the voice of the cotton trade is heard to the effect that any extensive scheme of protection will split the Prime Minister's party. What will probably happen is that the Safeguarding of Industries Act, instead of being repealed, will be extended and that the next election, whenever it comes, will be fought largely on tariff reform. Opponents of protection say that they do not see how, by increasing our costs at home, we are going to get over the tariff walls erected by nearly all the countries we do business with.

This is not the place to go at length into this time-worn controversy, however, and it is mentioned only because the rubber trade at the moment is more interested in it than in stress-strain curves or crêpe soles. In a general way the labor party and trade unions are on the side of free trade, but as a workman in a tire factory said, the men's politics are more of a bread and butter question than anything else. What was free trade, he asked, doing for the tire industry, with something like 3,000 workers at present either unemployed or only partially employed? The fact that the workers' organization has called the attention of members of Parliament to the serious position of the industry and has asked for a 33 1-3 per cent import duty is a significant fact, and should not be overlooked by those who say that labor is safe to vote against protection.

At the present time France is perhaps a more formidable competitor as regards tires than America, but whatever the country of origin, the majority of our manufacturers want to see their freedom of entry into this country stopped. Although it is clear that we are to have nothing in the way of a general tariff until after another general election, it is a foregone conclusion that the tire trade is among those referred to by the Prime Minister at Manchester as being hard hit by free imports, and that it will receive the protection it deserves under the act already in existence seems likely.

Institution of the Rubber Industry

The opening meeting of the Manchester Section was held on October 15, when H. C. Young gave an address on mixers, forcing machines and calenders, under the general title of "Rubber Machinery." Captain Gray presided over a small attendance in the absence of L. C. Mandelberg, chairman of the section. Mr. Young insisted on the importance of power in a rubber works with regard to general costs, though a good deal depended upon the article to be manufactured, heavy articles like tires naturally requiring more than such things as rubber heels and washers. Where high power was required it was absolutely necessary to discover friction wastages. He had gone carefully into this matter and had made startling discoveries which convinced him that in some cases the coal bill approached the labor bill in its effect upon costs.

Attention, he said, had lately been centered upon extrusion machinery with the idea of finding out if the process was governed by any laws. On this point he mentioned that the United States Bureau of Standards had issued a pamphlet on the extrusion of paints and allied material and an extension of this inquiry to the extrusion of rubber by forcing machines would be of value. His experiments suggested that there was a law governing correct extrusion, especially connecting aperture with pressure. He had thought that the area in contact with the rubber flow possibly influenced the case in the extrusion of rubber, but this influence was nothing like so great as that of the die-box or the actual friction of the rubber scouring the cylinder.

Another matter referred to was the load factor of calenders. A good deal of capital was tied up in heavy plant and if it was possible to run full load for 99 hours out of 100, good value would be obtained. His experience in regard to calenders was that if a manufacturer got 50 useful hours out of 100 at anything like full load he was fortunate, though with mixing mills it was possible to get better results. With extruders the rubber manufacturer had to stretch himself to get a satisfactory load factor, because of cleaning out and die changing.

Referring to the responsibilities of the calender man and how much depended upon his state of health, the lecturer said that there was a school of thought that laid it down that we ought not to take away the skill from the workman. However, in various directions and operations that had been done with good results and the day of the man whose absence brought matters to a standstill had gone. Today there were measuring machines and machines working to such fine precision that the work could be done by any capable man.

The interesting question of static electricity in rubber works was mentioned, Mr. Young saying that no one had made any bold attempt to cope with the problem of neutralizing it. There were certainly many types of brush discharging apparatus, but they did not come up to requirements.

The ensuing discussion was concerned largely with the forcing machine. H. Savage, of W. T. Henley's telegraph works, in referring to the extrusion of metals being assisted by the application of heat, thought this might be difficult with rubber. Some American makers claimed that the British practice of assisting the screw by a side roller feed was not necessary, preferring to rely on a screw with a pitch decreasing toward the die. The chairman said that the rubber trade required some instrument which would indicate the heat conditions in tubing machines, mixers and calenders. At present they were entirely dependent upon the human element to gage the heat.

Fordyce Jones referred to the importance of the metal forming the dies and mentioned silica aluminum as being preferable to steel. Lubrication and the use of plasticum were also matters of interest and importance. Another matter mentioned was some new machinery brought out in America for rapidly slicing up blocks of plantation rubber, the pieces being carried forward in an automatic traveler. Mr. Young in his reply said he looked with a good deal of suspicion at the suggestion to use oils for facilitating extrusion. It was the lazy man's method of overcoming a difficulty. If the rubber was not coming out well, it was no good doctoring it, the defection being due to temperature and incorrect mastication. The instruments devised by the Cambridge Scientific Institute and Arca Regulator Co. served excellently for the recording of temperatures.

Rubber Scrap and Rubber Roadways

Meredith H. McKusick, who has been the leading spirit at the works of the Rubber Regenerating Co., Limited, Trafford Park, Manchester, has, mainly for family reasons, returned to America, thus following in the footsteps of S. Torrey, of the North Western Rubber Co., Limited. The Rubber Regenerating Co. reports business as having improved a good deal, necessitating a return to full time; but taking the reclaiming works as a whole it seems clear that with rubber at its present price the demand is not sufficient to keep the producing capacity employed sufficiently to make the business the satisfactory one it

was a few years ago, bearing in mind the increased costs of production.

In the interesting article on "The Huge Rubber Scrap Surplus," in THE INDIA RUBBER WORLD of September 1, 1923, it is pointed out that the consumption of scrap is not keeping pace with the consumption of crude rubber. The estimate is made that not one-fifth of the scrap rubber supply is being reclaimed as used by rubber manufacturers today, and it is therefore not surprising that many grades of scrap, including automobile tires, have become to a great extent valueless. In the article quoted there is an illustration depicting some marsh land filled up with rubber scrap in which tires seem to be prominent. This certainly seems the last resource of utility.

In England we are doing rather better than that because, in the case of one large town, at any rate, the borough engineer has accumulated a large heap of tires and has formed them into blocks for surfacing the highways. This is, of course, in the way of an experiment. If, however, it proves successful, there seems to be a likelihood of discarded motor tires again having some market value. Probably the firms which are eager to get contracts for the regular sort of rubber pavement will not look complacently upon the rubber scrap roadways made by engineers. The estimated cost of the Bradford venture is given at £2 per square yard, but it is expected that future work will cost less than half as much.

Rubber Road Paving in Manchester

During a week-end in October an interested crowd watched the laying of an experimental strip of rubber paving in one of the city's busiest thoroughfares, over which the weight of the daily traffic is estimated at 15,000 tons. The rubber slabs were made by Chas. Macintosh & Co., Limited, and embody an invention of T. A. Tarkington of their staff. The rubber is of special wear-resisting quality, the slabs being reinforced with metal bars in order to prevent the creeping or lifting of the rubber, each slab being secured to its neighbor by steel dowel pins. The slabs are grooved on the surface so as to give horses a foothold, the firm claiming from the experience gained in one of their works' entrances that horses get a better foothold on such rubber than they do on stone ruts.

British Notes

The interesting announcement is made that the large factory put up at Golborne, Lancashire, by Harbens, Limited, for the manufacture of artificial silk at a cost of about £160,000 has been acquired by J. Mandleberg & Co., Limited, the well-known waterproofer, and that the present business of Harbens, Limited, will be absorbed. This will insure to Mandleberg's ample accommodation for the extension of their business.

William Thomson, the well-known Manchester consulting chemist, who died in October, was better known to the rubber trade of thirty years ago than to the trade of today, some researches that he had made and expert evidence given in the courts on several rubber cases having won him a reputation. Rubber, however, was never more than a side line with him, and when a few years ago he remarked that he never got any work to do on rubber now-a-days it is unlikely that the lost emoluments bothered him at all. One of his most important researches was that made in conjunction with F. Lewis in the action of copper and various other metals on rubber, this being an elaboration of Burghardt's discoveries as far as copper was concerned.

The Albion Rubber Co., Limited, of Limpley Stoke, near Bath, has gone into voluntary liquidation. The works were formerly occupied by Hollington, Western & Co., whose business outran their capacity. At a meeting of the creditors of the Albion company, held at Bath in October, it was stated that the company was unable to meet its liabilities, and voluntary liquidation was decided upon. The liabilities are £777 and the assets include the plant purchased in 1919 at a cost of £2,767. This is one of the very few British rubber mills run now or in the past by water power.

George Beldam has no longer any interest in the Beldam Tyre Co. (1920), Limited, of Brentford, Middlesex. Though he has been associated with the company since its inception 15 years ago, he has now disposed of all his interests therein. This in no way affects his position of life governing director of the Beldam Packing & Rubber Co., Limited, which was founded in 1870.

The Rubber Trade in Europe

By Our Regular Correspondent

France

Le Caoutchouc & La Gutta Percha is evidently doing its bit to help expand the French rubber industry. In the issue of October 15, 1923, appears a list of rubber articles, together with import figures for most of the items besides remarks on the extent of the local demand and the possible sales totals they may attain.

Thus imports of rubber combs (presumably during 1922) are given as being 1,500,000 francs; there is a very good demand for them and the total figure may be brought to 6,000,000 francs. Sponge rubber, imports of which were 1,000,000 francs, is also in good demand and up to 3,000,000 francs worth of these goods could be sold. Vulcanized rubber thread imports amounted to 10,000,000 francs, and the annual figure could be raised to 15,000,000 francs. The possibilities for imitation leather, which is not manufactured in France at present, are held to be unlimited. Belting of rubber or balata is much in request. Annual imports amount to about 9,000,000, of which England alone supplies more than 50 per cent. The market for surgical goods is unlimited. Dental rubber is another article not manufactured in France and for which a fair market could be developed. Rubber gums and cements for shoes and the like have been neglected up to the present, but sales could be brought up to over 2,000,000 francs.

Another line sadly neglected by rubber manufacturers is the making of rubberized garments. Imports of these were about 2,600,000 francs, but the turnover could very well be increased ten-fold.

Germany

Many months ago it was recorded in these columns that thoughtful persons in Germany were viewing the future with anxiety, as an economic crisis seemed to them to be inevitable. At that time not much heed was paid to their warnings by their compatriots, who were misled by the unnatural business activity apparent in every branch of German industry. What if the mark did become more and more worthless, every fresh drop in its value called for increased buying, and manufacturers had more orders than they could fill; so let the mark continue to fall. But in the last few months a change took place. Manufacturers and dealers became more and more aware of the fact that German goods were becoming too expensive and that orders, both foreign and local, were falling off in an alarming manner.

Besides this, prices of raw materials and coal were growing exorbitant. Local coal dealers profiteered to such an extent that at times German coal was twice as expensive as imported coal. The abnormal costs of coal influenced the price of other materials like solvents. This upward tendency has become still more marked since the introduction of the gold mark calculation and it is a fact that many suppliers of raw materials charge customers paying in foreign currency up to 20 per cent less than they charge those paying on the gold-mark basis.

Prices for compounding ingredients have also been affected and of late zinc oxide, lithopone, chalk, and barytes have become much more expensive. As a result of the Ruhr occupation, deliveries of certain raw materials from this territory are attended with great difficulties so that a partial shortage of materials like litho-

pone, zinc white, white lead, lampblack, and such aniline colors as are used in the rubber industry is already beginning to be felt.

So that under present circumstances, with shortage of capital, difficulty in securing credits, decreasing turnover and increasing costs, manufacturers and dealers are constrained to limit their activities, with the result that business is entering a period of stagnation.

The precarious economic condition has roused authorities, who are now attempting to take steps to improve the situation when, as some will have it, it is too late to mend matters. Thus the export ban on a number of articles has been lifted; a new currency is expected to aid in restoring sound conditions, while it is further proposed to modify the laws hedging in the 8-hour-day so as to permit the laborer to work two hours overtime on any 30 days which the employer may indicate. For permission to obtain more overtime work, the employer must betake himself to the proper authorities. In any case the maximum number of hours a laborer may work must not exceed 10, but men doing dangerous or very hard work must not be required to exceed the eight-hour day.

Berlin Automobile Exhibition

The German Automobile Exhibition at Berlin, held from September 28 to October 7, 1923, proved extraordinarily successful. Practically all the best-known automobile firms were represented and also a large number of manufacturers of accessories. Among the exhibits of rubber manufacturers was the particularly attractive one of the Continental Caoutchouc und Gutta Percha Compagnie, Hannover, where could be seen besides cycle and motor-cycle tires, cords, giant pneumatics and the so-called elastic solid tires which have a hollow core. A new tire was the Continental aero-cord which is particularly suited to light vehicles as it has a pressure of only 1½ atmospheres. The fabric is specially prepared, and the tire itself is very light and has an extraordinarily powerful brake action even on asphalt and in rainy weather. Another novelty shown by this firm was the Continental alarm valve which automatically opens and issues a loud whistle as soon as there is under pressure. The valve is adjustable to from 3 to 6 atmospheres.

The Hannoversche Gummiwerke Excelsior A.-G., Hannover-Luminer, had an effective exhibit where solid tires and giant pneumatics of the "Excelsior-Tractor Cord" brand were stacked in huge piles. Excelsior knee rests, rubber cushions filled with sponge rubber, were the firm's newest contributions to the comfort of the motor-cyclist.

Besides cord tires and solid tires, the Asbest-und-Gummiwerke, Alfred Calmon A.-G., Hamburg, exhibited mats of rubber, brake-bands of asbestos, wedge-belts of rubber, cooling tubes, etc., and also a new kind of packing, "Calmonit," which is said to have proved its serviceability.

The Aktiengesellschaft Metzeler & Co. showed up-to-date types of tires for all kinds of vehicles as well as a variety of other accessories of rubber, all of excellent quality.

The giant pneumatics of Gummiwerke Fulda A.-G., Fulda, have deep lateral indentations going down to the steel band and are said to maintain a particularly good grip on slippery roads.

The largest tire shown measured 1560 x 160 mm., and is intended for armored cars. It was produced by the Liga Gummiwerke A.-G., Frankfurt-am-Main-Hausen, which firm also presented a number of oversize solid tires besides bicycle and motor-cycle tires.

Poppe & Co., Gummiwarenfabrik, Frankfurt-am-Main, exhibited solid tires up to the largest dimensions, besides rubber hose, matting, and a ventilator starting-band with rubber cover—a novelty.

Other firms of importance showing tires were Deka Pneumatik, G. m. b. H., Berlin O. 112; Berlin-Rixdorfer Gummiwarenfabrik Hans Schumann, Berlin N. 39; Offenbacher Gummiwerke Carl Stoeckicht, A.-G., Offenbach; Gummiwarenfabrik S. Herz, G. m. b. H., Berlin S. O. 33; Schmidt's Gummiwarenfabrik, Arthur Schmidt, A.-G., Stade in Hannover; and Gummiwarenfabrik M. & W. Polack A.-G., Merseburg.

A number of firms showed other accessories, tire-repair material, vulcanizing apparatus, and the like.

Leopold Steiner, Berlin-Schöneberg, demonstrated A T A repair patches. These are fluted and when pressed against the damaged tube a vacuum is formed which causes the patch to adhere without the aid of cement.

"Invulner" is a product of the Deutscher Invulner Vertrieb G. m. b. H., Frankfurt-am-Main and is intended to prevent blow-outs. It is introduced into the tube in a semi-liquid state and immediately and automatically closes holes up to 1 cm. in diameter arising during travel, thus preventing the delay entailed by usual methods of repairing tubes. Invulner contains neither acid, oil nor lime and does not affect the composition of rubber.

Fleming & Cie, G. m. b. H., Berlin-Charlottenburg, demonstrated various types of vulcanizing apparatus; particularly noteworthy were an electric apparatus for tubes and covers that can be attached to any light and used everywhere, and a traveling apparatus, "Liliput," for alcohol heat. The Handelskompagnie für Industriebedarf G. m. b. H., Tauentzienstrasse 14, Berlin, showed the *Rekord* vulcanizing apparatus with table that can be turned around completely so that defects can be repaired in any position.

Policemen's Rubber Clubs

This weapon is gaining in popularity here for two reasons. First the insecure conditions necessitate the use of some means of defense, and then no permit is required as with revolvers and the like. In many towns, the police are armed with this weapon, which has been found very useful in encounters with thieves and rowdies, and it is suggested that proper propaganda will help greatly to increase its use, to the special benefit of rubber manufacturers and dealers. The clubs used here are of gray rubber cord, 25 to 35 cm. long and 2 to 2½ cm. in diameter, though larger dimensions are recommended by some makers.

Terms of Payment Modified

The German rubber manufacturers have decided that as under the old terms of payment business became worse and worse, these should be modified. From October 16, calculations of payment are no longer to be based on the last official exchange quotations but on the next following exchange quotations.

How much good this arrangement will do is doubtful, as it stands to reason that buyers and sellers continue to risk more or less serious losses with the rise or fall of exchange. In future, too, the dollar is to be calculated at 4.20 basic marks instead of 4 marks, as has been the custom.

Priority Claims in Latex Spraying

In a recent issue of the *Gummi Zeitung*, the manufacture of rubber goods from latex was discussed and priority was claimed for Krause who invented a process similar to the Hopkinson process, in 1912. Now Dr. Werner Esch of Hamburg comes forward and claims that in 1911 he invented the process of obtaining rubber from latex by spraying in combination with hot air and published a description of his method in the *Gummi-Markt* of July, 1911. Krause, he points out, merely added the rotating disk under the spraying pipe.

German Tire Prices

Prices of German domestic tires were placed on a gold basis on August 12, 1923, and are now practically on the world market plane. On October 1, 1923, retail prices (converted to dollars at 4.20 gold marks to the dollar) were: size 760 x 100—cord, $22.50, fabric $16.54; size 815 x 105—cord, $28.35, fabric, $18.54; and for 820 x 120—cord, $30.60, fabric, $20.82. Continental, Dunlop and Peters no longer issue price and discount lists owing to the high cost of printing and paper. The unsettled conditions of the market still prevent attempts to introduce American tires here.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

MALAYAN producers are at present chiefly occupied in studying the statistical position and market trend of rubber, making forecasts as to probable consumption and production and their effect on the price of the commodity, and, in the case of young producers, roundly abusing Mr. Duncan and the restriction scale named after him.

The statistical position is considered good. London stocks have been decreasing beautifully while exports from Malaya are steadily being reduced, thanks to the tightening up measures applied recently to the restriction scheme. Thus in January 22,871 tons of Malayan rubber were exported; in February 19,907 tons; in March 23,646 tons; April 24,008 tons; May 20,115 tons; June 18,621 tons; July 17,017 tons; August 16,011 tons. On the other hand imports into the United States alone up to the end of June amounted to no less than 193,000 tons, or at the rate of 386,000 tons for the year. The puzzle to be solved is why, in spite of the decrease in stocks and increase in consumption, the price of rubber refuses to soar.

America in itself provides a good many reasons—the first reason inevitably being manipulation by the big consumers. The practical disappearance of America from the market for two months to the end of August naturally had a depressing effect on prices and was interpreted in a number of ways, to suit the individual taste. Chaotic conditions ruling in Europe do not tend to improve matters. Europe seems to be becoming more and more of a forlorn hope, to the bitter disappointment of producers, who not only find their chances of greatly increasing sales waning but, what to some seems almost as important, have to do without the convenient fact that an actively buying Europe would have proved against America. It is to a great number of planters most provoking that the crude rubber market should have to be so dependent on demand from America.

Such are hope and faith, however, that the business of making optimistic forecasts goes on undeterred by American predominance in and manipulation of the market or the fact that conditions in Europe are bad, or the additional fact that in spite of improved working of the restriction scheme, exports from Ceylon and Malaya will probably exceed the legalized allowance by at least 50,000 tons, owing to previous laxity, to say nothing of Dutch exports which are known to have increased considerably. Thus the estimated world's output of plantation rubber in 1923 is 360,000 tons. The consumption for the same year is put at 416,000 tons, America's share being conservatively placed on the same level as for 1922—296,000 tons, and 120,000 tons allowed for the rest of the world. This excess of consumption over production will not be without effect on stocks and so there is good reason for optimism.

Colonel Kunhardt, whose prophecies before the enforcement of restriction were reported in these columns, has again been considering the rubber situation. He remarks that visible stocks are being reduced at the average rate of 6,000 tons a month. The world's rubber consumption for 1924, he considers, will be 500,000 tons, with potential unrestricted production at 480,000 tons, and naturally he thinks the rubber position is excellent. In support of the Colonel's forecast comes the glad news that America is in the market again, so there is still more reason for optimism.

Restriction and the Young Producer

The so-called absurdities of the Duncan scale are the subject of much heated correspondence by certain vociferous young producers. As has been pointed out before, the working of the Duncan scale is often unfair as regards young producers, many of whom find that they are restricted 60 per cent and more instead of 40 per cent, while numbers of old estates are allowed more than they ever produced or ever can hope to produce! From the outset it was recognized that the owners of younger plantations would have to suffer under the inelastic provisions of the scale and much has been said about taking measures to relieve them, but although restriction has been in force eleven months nothing has been done about the matter. No wonder there is much bitter feeling and correspondence takes on a personal tone.

The Government is probably only too happy to know that some producers at least are really restricting and apparently intends to let well enough alone. It is having such a time of it finding ways of preventing forgery of coupons and smuggling, and arranging for the checking of acreages and outputs of small estates, that it is evidently content to remain inactive in cases not connected with smuggling, forging, or the like.

Incidentally, efforts to make restriction real instead of a farce appear to be succeeding. Coupons, being non-transferable, cannot be traded; forgery, which was an easy matter when coupons were poorly made and issued by the thousand, will be much more difficult now that coupons are being printed in England, and a good many errors in fixing export allowance have been corrected. The improved working of restriction seems to be indicated by the fact that for the ten months ended August, 1923, the actual export of Malaya-grown rubber was 138,570 tons, although the authorized allowance for the period was 145,314 tons.

However, it is pointed out that as the standard production on which restriction is based was put at an abnormally high figure, the fact that exports are less than the allowance means very little. Certainly it is difficult to gage with any degree of accuracy the effect of restriction, particularly when we find that while exports of rubber from the restriction area are receding, the reverse is the case with foreign rubber re-exported from Malaya. To illustrate: the net Malayan exports for the first eight months of 1923 are 17,486 tons (12.33 per cent) less than for the same period of the preceding year, while the totals for foreign rubber over the corresponding periods show an increase of 22,827 tons, or more than 100 per cent.

Nevertheless, the *Straits Times* is of opinion that the restriction law should be accepted as a permanency. This, it claims, would give a very much improved sense of security to the industry as a whole. But whatever one might be tempted to say about restriction on the basis of statistics, one thing is certain, very many companies have benefited to a large extent and most estates are now able to pay their way.

No Change in Restriction Basis

The average London price of standard quality smoked sheet, on which the export restriction scheme is based, was 1*s.* 2.994*d.* for the quarter ended October 31, 1923, the British Colonial Office has announced. As an average price of 1*s.* 3*d.* for that quarter was necessary to bring about an additional release of 5 per cent during the present quarter, no change has resulted in the basis for restrictions.

Ceylon

Total exports from Ceylon for the first ten months of restriction, from November, 1922, to August, 1923, inclusive, were 35,214 tons. Of this 2,149 tons represented imported rubber, and the remaining 33,065 tons Ceylon-grown rubber. This latter amount comprised 10,735 tons of unrestricted (stock) rubber and 22,330 tons of restricted rubber.

The assessed standard production for the period under consideration was 50,028 tons. Therefore the actual percentage of export of restricted rubber was 44.63 per cent, while the percentage allowed under restriction was 60 per cent, increased to 65 per cent for the months May, June and July, 1923.

Colombo Rubber Traders' Association

At the fifth annual general meeting recently held, the rubber situation was reviewed and the restriction scheme commented upon by J. J. Wall. It was his opinion that a substantial reduction in exports of rubber in the first year of restriction could not be expected. When the rules came into force 12,000 tons of stock were declared for which free export permits were granted, and this with the 3,000 tons per month which was the total exportable maximum from Ceylon, would bring the exports for the first twelve months of restriction to 48,000 tons a year, which would exceed the record exports of 1922. He further stated that the effect of restriction on exports would not be noticed until the second and subsequent years. However, on the whole, he concluded that conditions had improved.

In a final paragraph, it was pointed out to producers that a large percentage of sheet rubber offered for sale on the Ceylon market was in a mouldy condition and could not be classified with first quality. This mouldiness might be due to abnormally damp weather, but much of it was the direct result of impurities in the rubber and improper methods of packing. A defect in smoked sheet complained of recently was the presence of specks which were immediately noticeable when sheet was held up to the light. These specks appeared to consist of foreign matter accumulated in the rubber in process of smoking.

Netherlands East Indies

An official report on the cultures in the Netherlands East Indies during 1922 gives some interesting data concerning the rubber industry in these parts. Only 796 estates gave information regarding their area and output instead of 807 estates as in 1921.

The area planted to rubber increased from 513,010 bouws in 1921 to 526,190 bouws (1,754 acres) in 1922 while the tappable area advanced from 319,587 bouws to 330,387 bouws. Production at the same time rose from 61,987 metric tons (2,204 pounds) in 1921 to 72,163 tons in 1922. On 27 estates ficus and other kinds of rubber were grown, covering an area of 3,348 bouws, of which 1,179 bouws were productive. In the following table of areas, production and export, ficus and other plantation rubber are included:

	Total Area Bouws	Production Metric tons	Exports Metric tons
1916	.....	29,253	33,614
1917	.....	39,150	45,618
1918	450,264	51,112	44,050
1919	480,337	66,101	89,610
1920	486,385	69,102	76,750
1921	517,659	61,988	73,402
1922	529,538	72,163	103,460

Of the total area, 231,000 bouws are in Java, most of which—190,000 bouws—are concentrated in the districts Batavia, Preanger, Pasoerocan, Besoeki and Kediri. The area in Sumatra is about 282,000 bouws, 215,000 bouws being on the East Coast of Sumatra. The largest number of estates in any district is to be found in East Coast of Sumatra, where there are no fewer than 195. Preanger, in Java, comes next with 131 estates, but these cover an area of only some 51,000 bouws, against 215,000 bouws in the former district.

Hevea is usually planted alone, 428,000 bouws of the total 526,190 bouws being devoted exclusively to rubber. The rest consists chiefly of young rubber interplanted with some other crop—generally coffee—that is taken out when the rubber is older. Most of the mixed estates are in Java, where they cover an area of 82,703 bouws out of a total 98,023 bouws. East Java alone is responsible for about 60,000 bouws, of which 21,000 bouws are in Pasoerocan, and 28,000 bouws in Besoeki.

The average yield in kilos per bouw for the different districts varied considerably: Bantam 263, Batavia 158, Cheribon 191, Preanger Regencies 238, Pekalongan 164, Semarang 161, Banjoemas 173, Saerkarta 220, Madioen 117, Soerabaia 264, Kediri 204, Pasoeroean 201, Besoeki 204 (all in Java). Lampong Districts 220, Palembang 295, East Coast of Sumatra 243, West Coast of Sumatra 101, Tapanoeli 299, Atjeh 224, Riouw 121 (all in Sumatra). Western Division of Borneo 138, Southern and Eastern Division of Borneo 152, Menado 276.

The average yield per bouw for all Java and Madura was 202 kilos, for the outer possessions 231 and for all the Netherlands East Indies 218 kilos. It will be noted that the highest averages were obtained in Tapanoeli, 299, and Palembang 295, both in Sumatra; while at the same time the lowest averages—West Coast of Sumatra 101 and Riouw 121—were also reported for Sumatra.

Concerning native rubber we learn that while prices were from 20 to 30 gilders per picul (picul equals 133 1-3 pounds; a gilder is equivalent to $0.40) during the first three quarters of 1922, these increased to 60 and 65 gilders by the end of the year. An estimate of the number of trees owned by natives in the various districts gives a total of 50,210,000 trees. In Djambi there were 21,000,000; in Palembang 5,000,000; Benkoelen 20,000; Riouw and dependencies 4,000,000; Tapanoeli 1,800,000; East Coast of Sumatra, except Simeloengoen and Bengkalis, 2,440,000; Atjeh 50,000; southern and eastern division of Borneo 12,000,000; western division of Borneo 3,700,000.

As to gutta percha, in 1922 there were five government estates devoted to this product. The total area was 2,169 bouws, of which 1,490 bouws were in the producing stage, the total yield being 100,018 kilos—as compared with 79,289 kilos in 1921.

Interesting comparative figures concerning costs in cents per kilo follow:

	1921	1922
Salaries	76.2	45.4
Traveling expenses	8.9	4.1
Upkeep of productive area	58.7	45
Harvesting and transportation	77.6	67.3
Preparing and packing	124.7	73.2
Upkeep	18.9	18.8
Combating diseases	3	1.9
Various	25.1	17.6
Transportation to harbor	5.3	2
	398.4	275.3
Interest and depreciation	90.5	91.9
	488.9	367.2

The figures for 1922 show a marked decrease in costs, chiefly due to the working of a new factory. However, over against this decrease in costs must be placed an almost proportionate decrease in price realized, as in 1921 7.679 gilders per kilo were obtained while in 1922 this was reduced to 6.033 gilders per kilo.

Reorganization of Experiment Stations

People here are very much agitated over the question of the reorganization of the experiment stations.

The system of experiment stations was, properly speaking, begun in 1910. There are now in Java five experiment stations for the rubber industry: Besoekisch Proefstation, Proefstation Malang, Proefstation Midden-Java, Proefstation West-Java, and the Central Rubberstation. Besides these there are experiment stations for tea and tobacco. Planters and scientists have since 1917 requested the Government to institute chambers of agriculture, which they feel would lead to satisfactory relations with the Department of Agriculture and bring about unity in financial, personnel and general technical direction, which is very necessary to insure sufficient funds to the stations and to promote efficiency. At the same time, the individual experiment stations would retain their local and autonomous character. However, the Government has consistently shelved the matter. But recently the question of reorganizing the stations with a view to centralization has been brought before the Government and has evoked a storm of protest from planters and scientists who, in self defence, are once more pushing forward their requests for the Chambers of Agriculture.

Recent Patents Relating to Rubber

The United States

Issued* October 9, 1923

NO. 1,469,880 Dust-cap spring. J. A. Bowden, Los Angeles, Calif., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,469,881 Spring means for dust caps. J. A. Bowden, Los Angeles, Calif., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,469,882 Spring insert for dust caps. J. A. Bowden, Los Angeles, Calif., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,469,904 Tire filler core. S. Goodman, Livingston Manor, N. Y.

1,469,907 Playing ball. H. R. Hart, Montclair, N. J.

1,469,927 Tire valve. H. P. Kraft, Ridgewood, N. J.

1,469,941 Rubber receiver support for sound amplifiers. C. W. Kuen, Chicago, Ill.

1,469,966 Tire valve. M. C. Schweinert, West Hoboken, N. J.

1,469,996 Combined sweatband and bandeau. L. Cohen, St. Louis, Mo.

1,470,045 Rubber heel. F. J. Altenkirk, St. Louis, Mo.

1,470,048 Tire core with gas cells. T. J. Barker, Kansas City, Mo.

1,470,105 Cushion tire. E. E. Redden, Springfield, Mass.

1,470,138 Tire wrapper. M. Blumenthal, Brooklyn, N. Y.

1,470,239 A stud for use in an air tube. T. B. McLeroth, assignor to T. B. McLeroth (Tubes) Limited—both of London, England.

1,470,240 Demountable rim. F. H. Moyer, Johnstown, Pa.

1,470,271 Valve for pneumatic tires. R. S. Burn, Birmingham, England.

1,470,302 Balanced golf ball. W. I. Thomas, assignor to Kinesthetic Process Co., Inc.—both of New York, N. Y.

1,470,319 Dust cap for valve stems. B. M. Berngartt and M. M. Berngartt, Baltimore, Maryland.

1,470,488 Fruit jar sealing-ring opener. W. M. Saunders, Reading, and L. V. Roy, Beverly, Mass.

1,470,546 Blow-out boot for pneumatic tires. L. D. Shilling, Kalispell, Mont.

1,470,569 Demountable rim. J. O. Hinerman, Aleppo, Pa.

Issued* October 16, 1923

1,470,598 Pillow, marine life saving belt, and the like. M. M. Dessau, London, England.

1,470,626 Disk wheel. H. H. Kranz, assignor to The Hydraulic Steel Company—both of Cleveland, Ohio.

1,470,652 Graphic display chart. H. W. Slauson, Hartsdale, N. Y., assignor to Kelly-Springfield Tire Co., New York, N. Y.

1,470,657 Apparatus for vulcanizing tire casings. J. Traum, Coshocton, Ohio.

1,470,726 Tire with sponge rubber core. E. Gratt, assignor to O. C. Wertheimer—both of Watertown, Wis.

1,470,908 Combination life-preserver and swimming device. J. Catanzaro, Framingham, Mass.

1,470,913 Cushion tire. F. E. Craig, Lawrence, Mass.

1,470,922 Resilient tire. E. G. Hulse, assignor to Kelly-Springfield Tire Co.—both of Cumberland, Maryland.

1,470,924 Tire and fabric therefor. A. E. Jury, Rutherford, N. J., assignor to Morgan & Wright, Detroit, Mich.

1,470,938 Pneumatic wheel. J. M. C. Semery, Paris, France.

1,470,999 Bloomers. A. Morganstern, New York, N. Y.

1,471,035 Detachable trimming for low shoes. A. B. Keenan, Pittsburgh, Pa.

1,471,042 Combination leather, rubber and coiled spring heel. A. E. Lewis, Ingersoll, Ontario, Canada.

1,471,070 Solid rubber tire. M. R. Shaw, Springfield, assignor to the Fisk Rubber Co., Chicopee Falls—both of Mass.

1,471,119 Cushioned horseshoe. W. H. Giles, Burton-upon-Trent, England.

1,471,266 Protective pneumatic casing for tires. M. L. Hundeby, San Francisco, Calif.

Reissues

15,699 Apparatus for plying up tire fabric. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

Issued* October 23, 1923

1,471,322 Pressure gage for tires. A. Badowski, assignor by mesne assignments to Tiregage Valve Corp., both of Charleston, West Virginia.

1,471,323 Pressure gage for tires. A. Badowski, Charleston, West Virginia.

1,471,324 Tire-stem pressure gage. A. Badowski, assignor to Tirometer Valve Corp., of America, both of Charleston, West Virginia.

1,471,325 Tire-stem pressure gage. A. Badowski, assignor to Tirometer Valve Corp., of America, both of Charleston, West Virginia.

1,471,580 Cushion tire. J. S. Walton, Los Angeles, California.

1,471,729 Powder-puff holder. V. Guinzburg, assignor to I. B. Kleinert Rubber Co., both of New York, N. Y.

1,471,839 Mouth adjuster with elastic strap. G. T. Epling, Welch, West Virginia.

1,471,882 Demountable brake band. C. E. Carlson, Brooklyn, New York.

1,471,885 Floating toy. M. M. Dessau, London, England.

1,471,886 Toy balloon. M. M. Dessau, London, England.

1,471,914 Brake structure. V. W. Page, New York, N. Y.

1,471,949 Armored tire. J. T. Doranski, Chicago, Illinois.

1,471,968 Elastic bands as shock absorbers. J. V. Martin, Garden City, New York.

1,471,981 Tire mileage indicator. A. G. Sargent, New Haven, Connecticut.

Issued* October 30, 1923

1,472,160 Dust cap for tire valves and the like. A. Fessler, High Bridge, New Jersey.

1,472,166 Acid-proof container. R. T. Griffiths, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,472,271 Armored pneumatic disk wheel. W. C. Hawkins and V. C. Bloodgood, both of Harvey, Illinois, assignors of one-third to F. P. Hawkins, Chicago, Ill.

1,472,330 Waterproof garment. W. L. Fry, New Rochelle, New York.

1,472,383 Tire. W. C. Bilham, Southampton, England.

1,472,521 Building element with hard rubber section. M. M. Harrison, assignor to The Miller Rubber Co., both of Akron, Ohio.

Issued* November 6, 1923

1,472,812 Device for repairing pneumatic tires. E. F. Pawsat, Sheboygan, Michigan.

1,472,865 Play ball, float, etc., made of twisted strips of crepe rubber. M. M. Dessau, London, England.

1,472,903 Cushion tire. L. R. Davis, Weehawken, New Jersey, assignor to Providence Rubber Co., Providence, Rhode Island.

1,472,906 Finger exerciser. C. R. Gorrell, Toledo, Ohio.

1,472,913 Armored tire. P. Jones, Wigan, England.

1,472,986 Cushion tire. J. E. Mackay, San Francisco, California.

1,473,032 Dust cap. A. L. Freedlander, assignor to The Dayton Rubber Manufacturing Co., both of Dayton, Ohio.

1,473,090 Erasing attachment for pencils. G. E. Ferry, Omaha, Nebraska.

1,473,099 Scarf with elastic neckband. F. H. Holmes, Chicago, Illinois.

1,473,171 Pressure gage with rubber air chamber. J. A. Bowden, Los Angeles, California, assignor to A. Schrader's Son, Inc., Brooklyn, New York.

1,473,178 Pneumatic toy. W. R. Dray, Chicago, Illinois.

1,473,184 Tire patch. T. J. Jackson, Columbus, Ohio.

1,473,260 Inflatable ball. R. H. Taylor, Rochester, New York.

1,473,270 Cushion tire. V. L. Wilson, Boise, Idaho.

1,473,414 Armored tire. J. M. Abrams, Brooklyn, New York.

1,473,428 Weather strip. S. F. Haskell, St. Louis, Missouri.

1,473,500 Rubber undergarment. C. L. Mowrer, Hagerstown, Maryland.

1,473,502 Cushion tire. C. E. Murray, Jr., Trenton, New Jersey.

1,473,525 Demountable rim. J. S. Swain, assignor to The Firestone Steel Products Co., both of Akron, Ohio.

1,473,539 Surgical truss. T. Beasley, Merton, England.

1,473,565 Tire with helical spring core. K. F. Koning, The Hague, Netherlands.

1,473,594 Packing. C. I. E. Mastin, Midland Park, New Jersey.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted October 2, 1923

234,563 Sponge rubber doll. M. P. Beach, Ridgefield, Conn.

234,575 Sole and heel with inflatable air cushions. C. Cooney, Dublin, Dublin County, Ireland.

234,598 Cushion wheel and tire. C. Knecht, St. Louis, Mo.

234,606 Sanitary bottle top. C. Lustgarten, Chicago, Ill.

Granted October 9, 1923

234,727 Golf ball. A. S. Chatfield, Flushing, N. Y.

234,773 Device for supporting the human body in water. W. T. Lawless, London, Ontario, Canada.

234,812 Tire valve. G. W. Sheely, Frederick, Maryland.

234,836 Inner tube. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of J. E. Glickert, Indianapolis, Ind.

Granted October 16, 1923

234,922 Armored tire. E. H. Jones, Islington, London, N. 1, England.

234,967 Atomizer. A. Webber, Halifax, Nova Scotia, Canada.

234,997 Band brake. The MacBride Co., Southport, Maine, assignee of G. W. MacBride and G. C. Bonney—both of Boston, Mass.

Granted October 23, 1923

235,061 Non-Collapsible nipple. D. B. Broadwater, Millville, New Jersey, U. S. A.

Chemical Patents will be found on Page 162, Machinery and Process Patents on Pages 167-168.

235,063 Bottle stopper. Asa J. Buren, Chicago, Illinois.
235,073 Hose supporter. Julius Eisman, Toronto, Ontario.
235,084 Pessary. Fred M. Glover, West Point, Georgia, U. S. A.
235,159 Tire. The Goodyear Tire & Rubber Co., assignee of P. L. Litchfield, both in Akron, Ohio, U. S. A.

Granted October 30, 1923

235,218 Blowout patch. J. Bordas, Miami, Florida, U. S. A.
235,230 Tire. C. F. A. Gray, Montreal, Quebec, Canada.

Granted November 6, 1923

235,364 Cushion tire. E. H. Fitch, Hudson, Ohio, U. S. A.
235,430 Stone guard for dual pneumatic tires. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of S. P. Thacher, Freehold, New Jersey, U. S. A.
235,444 Solid tire. The Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ontario, assignee of A. Hargraves, Akron, Ohio, U. S. A.
235,445 Tire. The Fisk Rubber Co., Chicopee Falls, Massachusetts, assignee of W. F. Fording, Cleveland, Ohio, U. S. A.
235,476 Combined dust cap and valve cap. A. Schrader's Son, Inc., New York, N. Y., assignee of E. Van A. Meyers, East Orange, New Jersey, both in U. S. A.
235,477 Tire valve. A. Schrader's Son, Inc., assignee of M. C. Schweinert, both of New York, N. Y., U. S. A.
235,478 Holder for cigarettes. The Seamless Rubber Co., Inc., assignee of Fred O. Williams, both of New Haven, Connecticut, U. S. A.
235,494 Composite laminated structure with rubber bonding ply. H. N. Atwood, Monson, Massachusetts, assignee of G. B. Bains, 3rd, Reading, Pennsylvania, both in U. S. A.

The United Kingdom

Published October 3, 1923

202,026 Footballs, etc. A. Nield, 18 Reynell Road, Longsight, and G. H. W. Blick, The Homestead, Ashton Lane, Ashton-on-Mersey, Sale—both of Manchester, England.
202,067 Flexible metallic tubing with rubber pads and washers. L. Doone and G. Hayter, Interlock Metal Hose Co., River Park Road, Wood Green, London, England.
202,094 Tire valve. H. A. Wood, 263 King street, Kingston, Ontario, Canada.
202,203 A device for detecting leakage from valves. J. Lumb, Copley Dene, Victoria Road, Elland, Yorkshire, England.
202,205 Reservoir brush with rubber sleeve. Ronning & Gjerloff, Aktieselskab, and V. Gjerloff, 28 Oresundsgade, Copenhagen.
202,210 Golf-practising device. M. Green, 43 Lordship Park, Stoke Newington, London, England.
202,219 Protecting strip for inner tube. A. L. Leeth, Aurora Heights, Virginia, and E. H. Leeth, 5330 Belt Road, Washington.
202,227 Ball-bouncing table game. H. E. Fielding, 3 Park avenue, Clitheroe, Lancashire, England.
202,280 Reservoir drawing-pen with rubber bulb. E. Keller, Zurich, Switzerland.
202,286 Rubber steering wheel grip. W. F. Ridge, 90 Rose avenue, Akron, Ohio.

Published October 10, 1923

202,298 Cushion wheel and tire. F. G. De Larochefoucault, 6 Rue de Seine, Paris, and P. Leriche, Rue de Bas-Igny, Igny, Seine-et-Oise, France.
202,334 Rubber and fabric driving belts. S. C. Caddy, 205 Richmond Road, Kingston, Surrey, England.
202,357 Rubber sole and heel with metallic studs. A. H. Smith, 26 Kingsland Road, and S. S. Bevan, 297 Upland Road, East Dulwich, both in London, England.
202,436 Dog collar with rubber throat protection. H. G. Buckham, Fern Lea, Green Lane, Timperley, Cheshire, England.
202,494 Knee grips for motor cycles. A. G. Barrett, and H. H. Burton, Granby Rubber Works, Post Office Place, Leicester, England.
202,498 Resilient heel and toe pads for horseshoes. T. H. Hutchesson, Chapel Yard, North Muskham, Newark, Nottinghamshire, England.
202,514 Ball with cork center and rubber binding element. W. C. Platts, Gefa Mills, Gargrave, Yorkshire, England.
202,519 Catamenial and like appliances. J. Vejvoda, 119 Churchill Road, Willesden Green, London, England.
202,528 Removable rubber pad for horseshoes. U. Corini and P. Celato, 19 Via Quattro Cantoni, Rome, Italy.
202,531 Screw-cap stopper with rubber washer. W. Woud, 28 Damrak, Amsterdam, Holland.
202,554 Nestable barrel with rubber grooves. O. F. A. E. Grumpelt, 28 ABC-Strasse, and E. R. Heusmann, 13 Monkedamm—both in Hamburg, Germany.
202,611 Cushion tire. M. N. A. Develay, 24 Rue de Dunkerque, Paris, France.

Published October 17, 1923

202,679 Tire valve. T. C. Enstone & Co. (Successors), Ltd., and W. E. Duley, Pyramid Engineering Works, Evelyn road, Birmingham.
202,697 Nozzle for football bladders, pneumatic cushions, etc. D. Moseley & Sons, Ltd., and A. Nield, Chapel Field Works, Ardwick, Manchester.
202,717 Knee grips for motorcycles. D. Moseley & Sons, Ltd., and A. H. C. Randall, Chapel Field Works, Ardwick, Manchester.
202,723 Pneumatic saddle for motorcycles. L. P. Larsen, Lyngby, near Copenhagen.
202,727 Surgical truss with sponge rubber pad. E. W. Salt, 5 Cherry street, Birmingham.
202,740 Tire valve. A. Schrader's Son., Inc., 783 Atlantic avenue, Brooklyn, New York.
202,792 Swimming device. D. E. Juett, Fordfield, Ampthill, Bedfordshire.
202,800 Rubber-studded horseshoes. H. J. Beachim, Willow Villa, Aston Fields, Bromsgrove, Worcestershire.
202,868 Rubber quarter tip for boots. I. T. S. Rubber Co., Ltd., 42 Great Russell street, and A. Levy, 7 Canterbury Mansions, West Hampstead—both in London.
202,912 Solid tire. L. H. Hounsfield, 21 Duppas Hill road, Croydon, Surrey.
202,930 Massaging device. A. D. Cross, Guards Club, Brook street, London.

Published October 24, 1923

203,028 Wool winder. A. E. Isted, 97 Amesbury avenue, Streatham Hill, London.
203,095 Resilient non-slip studs for horseshoes. R. N. Dowling, The Old Hall, North Muskham, Newark-on-Trent.
203,197 Golf tee. H. Coulson, 3 Earlesdon avenue, North, Coventry.
203,199 Folding hat peg with rubber cushion stop. J. W. Stott, 26 Cardigan lane, Kirkstall road, Leeds.
203,214 Umbrella ring with rubber core. F. W. Schroeder, 388 Kennington road, London.
203,327 Cushion tire. J. R. J. M. V. H. De La S. T. Ortiz-Escofet, 10 Rue de Passy, Paris, and A. E. L. Triana, 75 Avenue De St. Germain, Maisons-Lafitte, France.

Published October 31, 1923

203,350 Inflatable toy. T. Hille, 10 Winterfeldtstrasse, Berlin.
203,416 Rubber disk valve. Beldam Packing & Rubber Co., Ltd., and G. H. Robinson, 29 Cracechurch street, London.
203,426 Shaving brush with rubber head. T. C. Mills, 1 Swan Mead, Tower Bridge road, London.
203,454 Tilting bottle with rubber stopper for delivering measured quantities. L. Haimovitch, 20 Spianta, Castelletto, Genoa, Italy.
203,486 Stair pad with rubber nosing. A. E. Woodward, 8 Rost street, London.
203,487 Leather-and-rubber heel. H. Percival, The Poplars, Wellingborough, Northamptonshire.
203,501 Clamp for holding tire covers on a mandrel during vulcanization. S. Milburn, 50 Plasturton avenue, Cardiff.

New Zealand

Published September 6, 1923

47,749 Rubber bed-pan cover. E. G. Muir, Martin, New Zealand.
47,765 Truss with hollow rubber member. L. Ashkens, Wellington.

Published September 20, 1923

48,799 Polishing mop studded with rubber pads. H. R. Wilton, 94 Boulcott street, Wellington.
50,289 Baby soother. R. S. Dowell and A. W. Dowell, both of Globe Works, Chatsworth road, Clapton Park, London, E. 5., England.

Germany

Patents Issued with Dates of Issue

384,621 (December 4, 1921). Rubber tread patch. Heinrich Dresing, Bad Oeynhausen.
384,622 (September 10, 1922). Rubber heel. Arthur Kellog Pomeroy, Rockville, United States; represented by: Dr. C. Landeskroener, Dresden.
384,623 (October 20, 1922). Exchangeable rubber tread patch. Max Kunze, Stendal.
385,169 (September 6, 1922). Rubber cushion for horseshoe. Ubaldo Corini and Pietro Celato, Rome; represented by: H. Nähler, Seemann, and Varwerk, Berlin, S. W. 11.
385,400 (April 25, 1922). Sanitary bandage with sponge rubber strip and solid rubber foundation. Lentz & Cie., Neustadt a. Haardt.
385,466 (July 27, 1922). Pouch-shaped hollow body made of rubber skin. Radium-Gummiwerke m. b. H., Köln-Dellbrück.
385,966 (November 23, 1921). Injection syringe. Theodor Teichgraeber, A. G., Berlin.
385,968 (August 31, 1921). Spray for fluids. Enrico Garda, Paris; represented by: Hans Heimann, Berlin S. W. 61.

Design Patents Issued with Dates of Issue

853,562 (July 12, 1923). Rubber shoe lace. Bruno Meyer, Blankenburg, Harz.
853,684 (August 6, 1923). Shoe sole consisting of rubber sole with tip of other material. Gustav Adolf Jakubowssky, Hohenlimburg i. W.
853,736 (July 12, 1923). Rubber nipple connected with disk, pressball and sound. Gummiwarenfabrik M. Steinberg, Köln-Lindenthal.
853,814. (August 13, 1923). Rubber ring for penholders, to protect the pen. Otto Kosak, Börsterweg 213, Recklinghausen i. W.
853,838 (June 27, 1923). Button-on panties. C. Müller, Gummiwarenfabrik, A.-G., Berlin-Weissensee.
853,839 (June 29, 1923). Slip-on panties. C. Müller, Gummiwarenfabrik A.-G., Berlin-Weissensee.
853,869 (May 18, 1923). Rubber sole. Tomas Abarca Oros, Potsdamerstrasse 18-19, Berlin.

853,893 (July 16, 1923). Cap-shaped nipple with valve piece. Industriewerke Pausa, G. m. b. H., Pausa i. V.

853,900 (August 21, 1923). Sanitary binder. Richard Linke, Zittau i. Sa.

853,937 (August 16, 1923). Artificial leg with rubber foot. Anton Fendel, Karthäuserstrasse 68, Koblenz.

854,043 (August 9, 1923). Injection syringe for dental and allied purposes. Hanff & Co., G. m. b. H., Kassel.

854,224 (August 13, 1923). Rubber sole. Walter Teichert, Sangerhausen, Walkmühle.

854,239 (August 25, 1923). Injection syringe. Eugen Haller, Planufer 92 c., Berlin.

854,243 (February 15, 1923). Rubber bust supporter for sporting and bathing purposes, with button-on dress shields. Theodor Hille, Winterfeldstrasse 10, Berlin.

854,295 (August 22, 1923). Swimming animal of rubber or the like. Wilhelm Friedrich Thiele, Springerstrasse 9, Leipzig.

854,406 (August 9, 1923). Sanitary bandage of sponge rubber, with pockets for absorbent materials. Kurt Sautermeister, Rosengartenstrasse 16, Mannheim.

854,484 (May 11, 1922). Rubber sheet. Asbestund Gummiwerke. Alfred Calmon, A. G., Hamburg.

854,485 (May 11, 1922). Rubber sole. Asbestund Gummiwerke. Alfred Calmon, A. G., Hamburg.

854,616 (August 2, 1923). Rubber heel. Otto Werther, Helmholtzstrasse 38, Düsseldorf.

854,725 (February 5, 1923). Exchangeable rubber heel. Joseph Spangenberg, Kaiser-Friedrichstrasse 8, Charlottenburg.

855,125 (August 2, 1923). Rubber doll. Viktoria-Gummiwerke, G. m. b. H., Berlin.

855,429 (August 14, 1923). Rubber stamp-moistener. Degufrah, Deutsche Gummiwarenfabriken Franz Au & von der Halben, Berlin-Weissensee.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted September 11, 1923, Act of February 20, 1905

172,720 RUBPRON (Omitted from previous list)—hydrocarbon materials or asphaltum products, namely, mineral rubber used as a filler in rubber compounding, asphaltum used as a base for manufacture of asphalt paints and varnish, battery-sealing compound for cell batteries. The Chacon Trading Co., 82-92 Beaver street, New York, N. Y.

Granted October 23, 1923, Act of February 20, 1905

174,552; 174,553; 174,554; 174,555; 174,556. Illustrated herewith. Casings and tires made wholly or partly of rubber. The Federal Rubber Company of Illinois, Chicago, Illinois, and Cudahy, Wisconsin.

174,552

174,553

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174,569 Under the word BRUNSWICK and separating the words SEDAN CORD a circular figure, the field of which is red, bearing at the center, in white lettering, the words BRUNSWICK CORD and following the line of the circumference the firm name and address—rubber and fabric tires. The Brunswick-Balke-Collender Co., Wilmington, Delaware, and Chicago, Illinois.

174,619 ORTHO—Elastic tires. The Norwalk Tire & Rubber Co., Norwalk, Connecticut.

174,729 INTERLOCK—hose made wholly or partly of rubber or a rubber composition. Voorhees Rubber Manufacturing Co., Jersey City, N. J.

174,768 STILETTO, the letters of the word pierced by a stiletto, of which the hilt is formed by the S—garden hose. Baker, Hamilton & Pacific Co., San Francisco, California.

174,774 A-7 (Ethylidene Aniline)—compound used in curing rubber articles. The Rubber Service Laboratories Co., Akron, Ohio.

174,786 The words WHITE LINE, printed in white on a black background so divided that a white line seems to cross the words horizontally—automobile windshield wipers. White Products Co., Chicago, Illinois.

174,810 MAJOR—cotton fire hose. William & Charles Beck, Inc., Lawrence, Massachusetts.

174,813 An approximate oval, within which a hexagonal figure is centered having a special design above and below it—hose composed of rubber and fabric. Ingersoll-Rand Co., Jersey City, New Jersey.

174,814 RUFFIAN—hose of rubber and fabric. Ingersoll-Rand Co., Jersey City, New Jersey, and New York, N. Y.

174,817 GOOD HOUSEKEEPING, arranged one word centered above the other, and inclosed in an outline which follows the curve of the letters—fruit jar rubbers. Hamilton Rubber Manufacturing Co., Trenton, New Jersey.

174,849 LUCKSTONE, the central S extending in a flourish beneath the word—inner tubes for tires. Packard Motor Car Co. of New York, New York, N. Y.

174,893 NOMARKOFF—rubber covered molds for paper mills, bleacheries, tanneries, etc. Stowe & Woodward Co., Newton and Newton Upper Falls, Massachusetts.

174,896 R G inclosed in an approximately oval outline—tires wholly or partly of rubber. The Federal Rubber Co. of Illinois, Chicago, Illinois, and Cudahy, Wisconsin.

179,105 LUXOR—dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

Granted October 23, 1923, Act of March 19, 1920, Section 1(b)

174,923 NIAGARA, the letters broken to give shading effect and first three and last three letters underscored—brake lining. Buffalo Weaving & Belting Co., Buffalo, New York.

Granted October 30, 1923, Act of February 20, 1905

175,081 RUN EASY—bicycle tires and automobile inner tubes and casings. Simmons Hardware Co., St. Louis, Missouri.

175,090 Within the annular space provided by two circles, one within the other but not concentric, the words: VULCAN RUBBER PRODUCTS, VULCAN PROOFING CO.; and between the parallel lines outlining a portion of an arrow passing behind the circles the words: MADE IN BROOKLYN, N. Y., BY—offset blankets, rubber sheeting, sheet rubber, rubberized piano-player cloths, rubberized auto top fabric, and rubberized fabric of any description. Vulcan Proofing Co., Brooklyn, New York.

175,141 TAXITRUX—brake lining. Multibestos Co., Walpole, Massachusetts.

175,179 MAJOR—tires of rubber and fabric. The Denman-Meyers Cord Tire Co., Warren, Ohio.

Granted October 30, 1923, Act of March 19, 1920, Section 1(b)

175,222 In white letters on a black background within the annular space provided by two concentric circles the word SUPERFINE, and in black letters on a white background at the diameter the word GRANGERS—whiting for industrial purposes in rubber and other trades. Grangers Manufacturing Co., Boston, Massachusetts.

175,247 The words: "PERFECTION" PNEUMATIC ARCH CUSHION, within a circle resembling a stretching frame—arch cushions for use in boots and shoes. George A. Stetson, Boston, Massachusetts.

175,258 Representation of a rear wheel of an automobile and a hand with a hammer driving a nail into the tire, above which are the words: PEERLESS PUNCTURE CURE—tire puncture compound. Wayland D. Staplin, doing business as Peerless Specialty Manufacturing Co., Wichita, Kansas.

Granted November 6, 1923, Act of February 20, 1905

175,520 Representation of a pair of wings connected by the letter O having a flap at top and at bottom. On a placard across its center the word: DATALOID and adjoining the flaps the words DOUBLE and WING, respectively—interchangeable cut-to-shape resilient letters and figures. Davenport-Taylor Manufacturing Co., Chicago, Illinois.

175,557 SCOUT FORTY-NINE—rubber tires. Coast Tire & Rubber Co., Oakland, California.

175,558 TOWN AND COUNTRY—child's wagon tire. Puffer-Hubbard Manufacturing Co., Minneapolis, Minnesota.

175,560 JACK—pneumatic tires and inner tubes. Jack Tire & Rubber Co., Spokane, Washington.

175,590 SKWEZ-ME—dolls, rubber dolls, toy balloons, and squawkers. William Caldwell, New York, N. Y.

175,595 The word MAXIM printed horizontally and again perpendicularly, with the central X common to both words—golf balls. Harry C. Lee & Co., New York, N. Y.

175,599 Representation of the rising sun, streamer clouds, and a sea gull in flight, above which are the words: GUL-FLYT GOLF BALLS—golf balls. Gimbel Brothers, Inc., New York, N. Y.

175,604 Representation of a comet, on which is the word: MACLEAN'S—flotation devices, tennis balls, golf balls, toy balloons, and other toys. MacLean Drug Co., Chicago, Illinois.

175,630 RUBBER-WELD, across a black-centered disk bearing the words TRADE MARK—rubber repair outfits. Rubber-Weld Sales Co., Boston, Massachusetts.

175,647 UNCLE WIGGILY—inflated balls, toy balloons, and other toys. Fred A. Wish, Inc., New York, N. Y.

Granted November 6, 1923, Act of March 19, 1920, Section 1(b)

175,695 JUST A REAL GOOD TIRE—solid and pneumatic tires and tubes. Associated Tire Stores Corp., New York, N. Y., assignors to Century-Plainfield Rubber Co., Plainfield, New Jersey.

The Dominion of Canada

Registered

34,332 RHINO—rubber footwear and tires. Ames Holden Tire & Rubber Co., Ltd., Kitchener, Ontario.

34,352 GOODRICH—inner tubes; automobile and truck tires, solid and cushion; motorcycle and bicycle tires; baby carriage and carriage tires; hose, rubber cements, blow-out patches, flexible coupling disks, battery jars, belts and belting, gaskets, tire accessories and repair material, rubber mats, rubber sheet packing, valves, handle-bar grips, washers. The B. F. Goodrich Co., New York, N. Y.

34,353 GOODRICH—catheters, rubber bulbs, crutch tips, hot water bottles, dental rubber, and druggists' rubber sundries in general. The B. F. Goodrich Co., New York, N. Y.

34,356 DUNLOP—goods made wholly or partly of rubber, rubber compositions or substitutes, namely, solid rubber tires, pneumatic tire casings and tubes, tire liners, blow-out shoes, valve stem patches, repair patches, tire putty, cements, belts and belting, hose and tubing, heels and soles, horseshoe pads, tiling, mats, matting, flooring, stair treads, packing, jar rings, gaskets, valves, chair and crutch tips, weather stripping, frictioned cloth, tape, rolls, repair material. Dunlop Tire & Rubber Co., Ltd., Toronto, Ontario.

The United Kingdom

Published October 3, 1923

438,487 PAROBAND—belts and bands of elastic or inelastic material, suspenders, or braces. Robert MacKinlay Smith, 263 Eglington street, Glasgow.

438,767 VULPRUF, within an approximately oval border line—an adhesive preparation of rubber and gutta percha for tailors' use. Vultex Products, Limited, Kennans House, Crown Court, Cheapside, London, E. C. 2

439,111 SUPEROCK—rainproof and waterproof garments. M. Fidler & Co., Derby street, Cheetham, Manchester.

Published October 10, 1923

428,524 ARC—golf balls. The Avon India Rubber Co., Limited, 343-345 Euston road, London, N. W. 1.

437,410 WEDGE TREAD, each word enclosed in a wedge-shaped outline—rubber tires and inner tubes. The Miller Rubber Co., 1269 South High street, Akron, Ohio, U. S. A.

439,036 LIFEBUOY—waterproof and rainproof clothing not made of linen and not including boots, shoes, hats or caps, or similar articles. David Matz & Sons, 37 Angel street, Rochdale road, Manchester.

439,978 AQUAREIGN—waterproof and rainproof garments. Maurice Kusmark, 71 Great Ducie street, Manchester, Lancashire.

440,078 RELIANCE—goods of rubber, gutta percha, balata or compounds thereof, in Class 11. Reliance Rubber Co., Limited, 212-13 Upper Thames street, London, E. C. 4.

Published October 17, 1923

420,227 GOODRICH—India rubber goods exclusively in Class 40. The B. F. Goodrich Co., Limited, 117-123 Golden Lane, London, E. C. 1.

436,473 Within the oval of an ornate frame the representation of an eagle, evidently the Egyptian phoenix, and beneath this the word: PHOENIX—surgical india rubber goods, non-medicated, included in Class 11. Carl Otto Schimmer, 93 Aldersgate street, London, E. C. 1.

B438,706 Within the annular space provided by two concentric circles the words: NORTH BRITISH RUBBER CO., LIMITED, EDINBURGH; at the center of the circles a representation of a pair of scales balanced on a sword, underneath which is the word: TRADE-MARK—pencil and ink erasing rubbers and rubber bands. The North British Rubber Co., Limited, Castle Mills, Fountainbridge, Edinburgh, Scotland.

438,877 FLECTOR—disks of woven fabrics impregnated with rubber for use in flexible couplings. J. & A. Hillman, Limited, Castle Leather Works, Trindle Road, Dudley, Worcestershire.

439,675 BLACKAMOOR—packings and jointings included in Class 50. Beldam Asbestos Co., Limited, Lascar House, Staines Road, Hounslow, Middlesex.

Published October 24, 1923

B434,490 MAW'S WELFARE—nipples for feeding bottles. S. Maw, Son and Sons, Limited, 7-12 Aldersgate street, London, E. C. 1.

436,358 AJAX—goods made of rubber or gutta percha, exclusively in Class 40 but not including heels, tips and pads for boots and shoes, hoof pads or tires, or similar articles. The Greengate & Irwell Rubber Co., Ltd., Greengate Rubber Works, Greengate, Salford, Lancashire, and Irwell Works, Ordsall Lane, Salford, Lancashire.

436,364 GIRCO—goods of rubber or gutta percha, exclusively in Class 40, but not including soles or heels or similar goods. Same firm and address as for 436,358.

436,365 GIRCO—engine packing, hydraulic and steam, jointing material in the nature of packing, and hose, included in Class 50. Same firm and address as for 436,358.

Published October 31, 1923

438,586 ORO—rubber stamps, dating stamps, stamp pads, rubber stamp ink, metal stamps and metal stamp inks. Joseph Maximilian Lindner, 17 Farringdon Avenue, London, E. C. 4.

440,361 Within an outline suggesting a business card the words: AQUASHUTE, diagonally across; above which is the monogram, CR Co., LTD., the C encircling the other letters, and below which are the words GUARANTEED QUALITY. In the upper left corner are the words: MADE IN ENGLAND; in the lower left, C. R. Co., LTD., and in the lower right, LONDON—showerproof garments made in England. The Cornbrook Rubber Co., Ltd., 83 Farringdon street, London, E. C. 4.

440,864 STERGENE—goods of rubber or gutta percha exclusively in Class 40. W. & T. Williams, Ltd., 18 Bond street, Brighton, Sussex.

Published November 7, 1923

203,721 Rubber disks with anchoring pins for shoe heels. Plantation Rubber Manufacturing Co., Ltd., and M. M. Dessau, 14 Mincing Lane, London.

203,741 Sponge rubber cri-nasal and flexible sheet rubber gas-tight face mask. R. H. Davis and C. G. Rosling, 187 Westminster Bridge road, London.

203,747 Rubber and fabric golf tee mat. S. Ball, Heaton Park, Manchester.

203,754 Tire repair patch. J. Parker, Victoria street, Melbourne, Derbyshire.

203,888 Rubber cushioning device for insertion between the sole and inner sole of boots and shoes. K. Dressel, 6, Dorotheenstrasse, Erfurt, Germany.

203,900 Puncture-proof liner for tires. A. Manvers, 7 Garlinge road, Brondesbury, London.

New Zealand

Published September 6, 1923

20,007 BATES—rubber tires and air tubes for tires. Class 40. W. & A. Bates, Limited, St. Mary's Mills, off Marlboro road, Leicester, England.

B19,616 INGRAM'S, in script, and LONDON, in type—articles in Class 11, being instruments, apparatus and contrivances, not medicated, of india rubber for surgical or curative purposes or in relation to the health of men and animals. J. G. Ingram & Son, Limited, The London India Rubber Works, Felstead street, Hackney Wick, London, E. 9, England.

B19,617 INGRAM'S, in script, and LONDON in type—articles in Class 40, of india rubber and not included in other classes; namely, hot water bottles, water pillows, bulbs, tubing, insulation gloves, bellows, stoppers and bungs, etc. J. G. Ingram & Son, Limited, The London India Rubber Works, Felstead street, Hackney Wick, London, E. 9, England.

Designs

The United States

Issued* October 16, 1923

63,135 Tire. Term 14 years. Louis W. Hottel, Chicago, Illinois.

63,140 Tire. Term 3½ years. Fred A. Nied, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

Issued* November 6, 1923

63,227 Tire. Term 3½ years. Harry C. Hower, Chicago, Illinois.

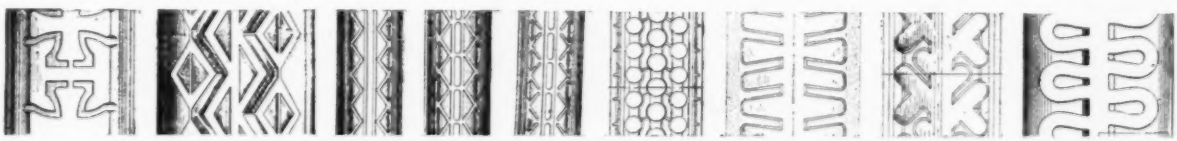
63,228 Tire. Term 3½ years. Harry C. Hower, Chicago, Illinois.

63,229 Tire. Term 3½ years. Harry C. Hower, Chicago, Illinois.

Issued* November 13, 1923

63,251 Tire. Term 14 years. Edward H. Broadwell, Longmeadow, Massachusetts.

63,257 Tire tread. Term 14 years. Earl A. Hecht, Mansfield, Ohio.



63,135 63,140 63,227 63,228 63,229 63,251 63,257 63,258 63,259

63,258 Tire tread. Term 14 years. Earl A. Hecht, Mansfield, Ohio.

63,259 Tire tread. Term 14 years. Oscar D. Hollenbeck, Racine, Wisconsin.

*Under Rule No. 167 of the United State Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Dominion of Canada

Registered

5,957 Tire. George Kiernan, Auckland, New Zealand.

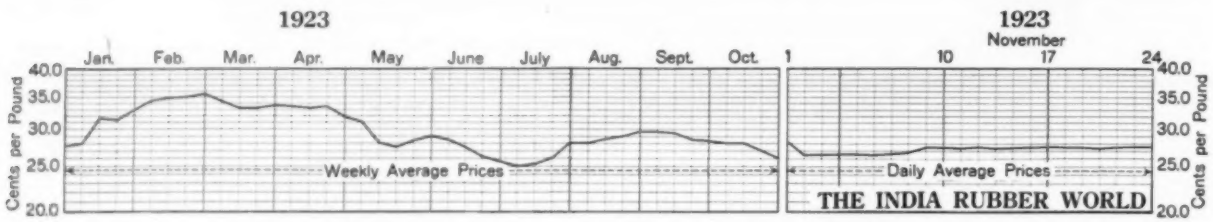
436,366 IRWELLIAN—goods of rubber or gutta percha exclusively in Class 40. Same firm and address as for 436,358.

436,367 IRWELLIAN—Same description, firm, and address as for 436,365.

437,409 RELLIM—rubber tires and tubes. The Miller Rubber Co., 1269 South High street, Akron, Ohio, U. S. A. For service in the United Kingdom address: Albert L. Mond, 19 Southampton Bldgs., Chancery Lane, London, W. C. 2.

438,921 PARAPED—machines and parts thereof, included in Class 6, for use in working rubber. Roland Francis Browne, trading as R. F. Browne & Co., 7 Mincing Lane, London, E. C. 3.

440,488 SIMPLIC—goods of rubber and gutta percha exclusively in Class 40. J. G. Franklin & Sons, Ltd., Birkbeck Works, Birkbeck Road, Hackney, London, E. 8.



Ratio Graph of New York Average Sales Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE spot rubber market for the past month has been very quiet. Price fluctuations were very narrow. Consumers as a whole have been holding off. Early in the month the feature of the market was the scarcity of crêpe. The premium asked for this grade was from 1 to 1½ cents over that for ribbed smoked sheets. Crêpe was sold for 28 cents for delivery the last day of October.

During the week ended November 24 the market was particularly quiet. Dealers are not inclined to cut the market and firm offerings from the Far East are very few and high. Rubber is apparently in firm hands. There is little buying by factories for either prompt or future delivery. Consuming interest in January-March delivery is expected to develop very shortly.

Parás continue dull and neglected. Balatas are steady and other rubber grades without market interest.

Imports of all grades during October, 1923, were 25,662 tons, compared with 23,946 tons one year ago. Plantation arrivals for October, 1923, were 24,726 tons, compared with 22,306 tons one year ago. Total importations of all grades for the ten months ended October 31 were 264,595½ tons, compared with 229,600 tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. November 1. Spot first latex crêpe, 26¾-26⅞ cents; Nov., 26¾-26⅞ cents; Nov.-Dec., 26⅞-27 cents; Jan.-Mar., 27⅝-27¾ cents; Jan.-June, 27⅞-28 cents.

November 24. Spot first latex crêpe, 27⅝ cents; Nov., 27⅝ cents; Dec.-Jan., 27¾-27⅞ cents; Jan.-Mar., 28-28⅛ cents; Jan.-June., 28⅜ cents.

November 1. Spot ribbed smoked sheets, 26¼-26⅜ cents; Nov., 26⅜-26½ cents; Nov.-Dec., 26½-26⅝ cents; Jan.-Mar., 27¼-27½ cents; Jan.-June, 27⅝-27¾ cents.

November 24. Spot ribbed smoked sheets, 27⅝ cents; Nov., 27⅝ cents; Dec.-Jan., 27⅝-27¾ cents; Jan.-Mar., 28-28⅛ cents; Jan.-June, 28¼-28⅜ cents.

November 1. Spot No. 1 amber crêpe, 25¼-25½ cents; Nov., 25¼-25½ cents; Nov.-Dec., 25½-25⅝ cents; Jan.-Mar., 25¾-26 cents; Jan.-June, 26-26¼ cents.

November 24. Spot No. 1 amber crêpe, 26⅜-26½ cents; Nov., 26⅜-26½ cents; Dec.-Jan., 26½-26⅝ cents; Jan.-Mar., 26⅝-26½ cents; Jan.-June, 26⅞-27 cents.

November 1. Spot No. 1 rolled brown crêpe, 23⅞-24 cents; Nov., 23⅞-24 cents; Nov.-Dec., 24-24⅛ cents; Jan.-Mar., 24-24¼ cents.

November 24. Spot No. 1 rolled brown crêpe, 25½-25¾ cents; Nov., 25½-25¾ cents; Dec.-Jan., 25¾-26 cents; Jan.-Mar., 26⅛-26¼ cents; Jan.-June, 26¼-26⅜ cents.

SOUTH AMERICAN PARAS AND CAUCHO, November 1. Spot, upriver, fine, 21½-21¾ cents; islands fine, 19¼-19½ cents; upriver coarse, 17¾-18 cents; Cametá, 11-11¼ cents; caucho ball, 18¾-19 cents.

November 24. Spot, upriver fine, 23-23¼ cents; islands fine, 20¼-20½ cents; upriver coarse, 18¾-19 cents; Cametá, 11¼-11½ cents; caucho ball, 20½-20¾ cents.

London

The London market in November exhibited the same dullness and lack of consumers' interest as characterized the New York market, which as usual followed the lead of London.

The Colonial Office has announced that there is to be no change in export quota from Ceylon and the Malay States, the figure remaining at 60 per cent. This figure under the restriction scheme is governed by the price average for the preceding quarter, and had it worked out at one-third per pound, there would have been an increase in rubber exports of five per cent, which would have meant a material addition to total supplies. The average barely missed attaining the required amount to warrant the increase being 14.994 pence.

Reported London spot stocks show a small increase over those of a month ago. The record is as follows: October 30, 58,423 tons; November 7, 59,300 tons; November 14, 60,405 tons; November 20, 59,958 tons.

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and November 26, the current date:

Plantation Hevea	November 25, 1922	October 25, 1923	November 26, 1923
LATEX			
Rubber latex (Hevea)....	@	$1.30 @	$1.30 @
CREPE			
First latex	$0.24½@.24¾	.27½@.27¾	.28 @.28¼
Off latex	.23¾@	.27¼@	.27¾@
Amber No. 1	.24 @	.24½@	.27 @
Amber No. 2	.23¾@	.24¼@.24½	.26½@
Amber No. 3	.23¼@	.24 @	.25½@.26
Brown, clean, thin	.23½@	.24¼@.24½	.26 @
Brown, specky	.22¾@	.24 @.24¼	.25¾@
Brown, rolled	.22½@	.24 @	.26¼@
SHEET			
Smoked, ribbed	.24½@.24¾	.25⅞@.26	.27¾@.28
Smoked, plain	.23 @	@	†.26½@
Unsmoked	.22¾@	@	†.25½@
SCRAP			
Colombo scrap No. 1	.17½@.18	.21 @	.24 @
Colombo scrap No. 2	.16 @.17	.20 @	.23 @
East Indian			
PONTIANAK			
Banjermassin	.08 @	.07 @.08	.07 @.08½
Balembang	@	.07 @.08½	.07 @
Pressed block	.13 @.15	.12½@.13½	.12½@.13
Sarawak	.06⅝@.06¾	.07 @	.06 @.07

Crude Rubber Market—*Continued*

South American

PARAS	November 25, 1922	October 25, 1923	November 26, 1923
Upriver, fine	.24 @	.22¼@.22¾	.23 @
Upriver, fine	*.32½@	*.31¾@	*.31¾@
Upriver, medium	.21 @	.20 @	.21 @
Upriver, coarse	.17 @	.17¾@	.19 @
Upriver, coarse	@	*.30 @	*.28 @
Islands, fine	.22 @	.19¾@.20	.21 @
Islands medium	19¾@	@	†.18 @
Islands, coarse	.12½@	.11 @	†.10 @.11
Cametá	.12 @	.11¼@.11½	†.11 @.11½
Acre Bolivian, fine	.24½@	.22 @.22½	.23½@.24
Acre Bolivian, fine	*.32½@	*.32 @	*.32 @
Beni Bolivian	.24½@	.22¾@	.24 @
Madeira, fine	.26 @	.23 @	.24 @
Peruvian, fine	.22½@	.21 @	.21 @
Tapajos, fine	.22½@	.21 @	.22 @
CAUCHO			
Upper caucho ball	.18 @	.18¾@.19	.21 @
Upper caucho ball	*.27 @	*.30¾@	*.28½@
Lower caucho ball	.17¼@	.17 @	.18½@

Maniçobas

Ceará negro heads	†.20 @	@	@
Ceará scrap	†.18 @	@	@
Maniçoba 30% guaranty	†.15 @	@	@
Mangabeira, thin sheet	†.20 @	@	@

Centrals

Central scrap	.15 @.117½	.12½@13½	.17 @
Central wet sheet	.07 @.09	.13¼@.14	.16 @
Corinto scrap	.15½@.17½	.13½@.14	.17 @
Esmeralda sausage	@	.26 @	.17 @
Guayule washed & dried	.26 @	.26 @	.26 @

Africans

Benguela, No. 1, 28½%..	.10 @.11	@	.17 @
Benguela, No. 2, 32½%..	.08 @	.13 @.15	.13 @.15
Congo prime, black upper	.13 @.14	.20 @.21	.20 @.21
Congo prime, red upper	.15 @	.22 @	.19 @.20
Kassai, black	.12 @.13	.21 @.22	.20 @.21
red	.14 @.15	.19 @.21	.19 @.20

Gutta Percha

Gutta Siak	.17 @	.15½@.16	.16¼@
Gutta Soh	@	.26 @	.27 @
Red Macassar	2.80 @	3.00 @4.00	3.00 @

Balata

Block, Ciudad Bolivar	.58 @.60	.69 @.70	.70 @
Colombia	.49 @.52	.55 @.56	.55 @.56
Panama	.49 @.52	.54 @.55	.55 @.56
Surinam, sheet	.70 @.71	.73 @.74	.75 @
amber	.74 @.75	.76 @.77	.80 @

Chicle

Colombia	.25 @.30	.25 @	.25 @
Honduras	.62 @	.62 @	.62 @
Venezuela	.63 @	.63 @	.63 @
Yucatan, fine	.65 @	.65 @	.65 @

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

Comparative Low and High New York Spot Rubber Prices

	November 1923*	November 1922	November 1921
PLANTATIONS			
First latex crêpe	$0.26⅞@$0.28	$0.22½@$0.24½	$0.16 @$0.19
Smoked sheet, ribbed	.26⅜@ .27⅝	.22⅛@ .24⅛	.16 @ .19
PARAS			
Upriver, fine	.21½@ .24½	.23½@ .24¼	.22 @ .24½
Upriver, coarse	.17¾@ .19¾	.17 @ .18½	.12 @ .14½
Islands, fine	.20¼@ .25½	.21 @ .22¼	.20¼@ .22½
Islands, coarse	.11 @ .20½	.12 @ .16	.09 @ .16¼
Cametá	.11 @ .13	.09¼@ .14½	.10 @ .11½

*Figured to November 24, 1923.

Reclaimed Rubber

Prices on reclaimed rubber grades have shown fractional advances in a few grades only during the past month; however, all prices are firmer because of the improved outlook and optimistic forecast for the months just ahead. Consumers are realizing the unusual values now available in reclaims and are more ready to purchase for future needs than the reclaimers are to sell ahead on current prices, which fail to show a fair profit and must necessarily rise to a better level as soon as active buying attains the expected headway.

New York Quotations

November 24, 1923

Prices subject to change without notice

Reclaimed Stocks

FRICTION		
Compounded	*lb.*	$0.17½@$0.18
Pure gum friction	*lb.*	.21½@ .22½
TUBE		
Compounded	*lb.*	.12¼@ .12½
Floating	*lb.*	.15¼@ .15½
AUTO TIRE		
Black	*lb.*	.09 @ .09¼
Black, washed	*lb.*	.11 @ .11¼
Dark gray	*lb.*	.10 @ .10½
Light gray	*lb.*	.10¾@ .11¼
White	*lb.*	.13 @ .13¼
SHOE		
Unwashed	*lb.*	.10 @ .10¼
Washed	*lb.*	.13 @ .13½
MISCELLANEOUS		
Mechanical, black	*lb.*	.09 @ .10
High grade red	*lb.*	.13¼@ .13½
Truck tire	*lb.*	.08¼@ .08¾

New York Average Sales Prices of Spot Rubber

PRICES IN CENTS PER POUND
October, 1923

PLANTATIONS	1	2	3	4	5	6	8	9	10	11	12*	13	15	16	17	18	19	20	22	23	24	25	26	27
Sheet																								
Ribbed smoked	28⅛	27⅞	28⅛	28⅛	28⅛	28¼	28⅛	27¾	27⅜	27½	....	27½	27	26¾	26½	26⅝	26⅛	25¾	25⅞	26⅜	26⅛	25⅞	25¾	26
Crêpe																								
First latex	28⅜	28⅛	28⅜	28⅜	28¼	28½	28¼	28	27⅝	27⅞	....	27⅞	27⅜	27¼	27¼	27½	26¾	26½	26⅜	27⅜	27⅜	27⅛	27	27
Off latex	27¾	27¾	27⅞	28	27¾	28	27⅞	27⅝	26⅞	27⅛	....	27⅛	26⅝	26¾	26⅝	26¾	26	25¾	25¾	26½	26⅝	26⅜	26⅜	26¼
No. 1 blanket	27⅛	27¼	27⅜	27¼	27¼	27¼	27⅛	26⅞	26½	26½	....	26½	26⅜	25⅞	25⅝	25⅞	25½	25	24⅞	25½	25¼	25⅛	25	24¾
No. 2 blanket	26⅝	26½	26⅝	26½	26⅜	26⅜	26¼	26	25⅞	25⅞	....	25⅞	25½	25⅛	24⅞	25	24½	24¼	24⅛	24¾	24¾	24⅛	24⅛	24
No. 3 blanket	26⅛	25⅞	26	26⅛	26	26	25¾	25⅝	25⅜	25½	....	25½	25	24¾	24½	24½	24	23⅞	23¾	24½	24⅜	23⅝	23¾	23⅝
Thin, clean brown	26⅞	26⅞	27	26⅝	26½	26½	26⅜	26	25⅞	25⅞	....	25⅞	25½	25½	25⅛	25⅛	24¾	24⅝	24⅝	24⅞	24¾	24⅜	24½	24⅜
Specky brown	26½	25⅞	26¼	26¼	25⅞	25⅞	25⅞	25⅝	25¼	25½	....	25⅞	24⅝	24¾	24⅜	24¾	24⅓	24	24	24⅓	24¼	24	24	23⅝
Rolled brown	26	26¼	26⅛	26⅜	26⅛	26¼	26⅛	25⅞	25½	25¾	....	25¾	25	25¼	24⅞	25⅛	24½	24¼	24⅛	24½	24¼	24	24	24

*Holiday.

New York Average Spot Rubber Prices

PRICES IN CENTS, PER POUND

	October, 1923			November, 1923																				
PLANTATIONS	29	30	31	1	2	3	5	6*	7	8	9	10	12	13	14	15	16	17	19	20	21	22	23	24
Sheet																								
Ribbed smoked	26	26¼	26⅜	26½	26¼	26⅜	26¼	....	26⅜	26¾	27½	27¼	27⅛	27¼	27	27¼	27⅛	27¼	27⅜	27⅜	27⅜	27⅝	27⅜	27⅝
Crêpe																								
First latex	27	27⅛	27⅜	27¾	27⅝	27⅜	27⅜	....	27¼	27⅝	28⅛	28	28	28⅛	27½	27⅝	27⅝	27½	27⅝	27⅝	27⅞	27⅞	27⅞	27⅞
Off latex	26⅜	26½	26⅞	26¾	26¾	26⅝	26⅜	....	26⅜	26⅞	27⅜	27⅛	27⅛	27½	26⅞	26¾	26⅞	26⅞	27½	27¼	27½	27⅝	27⅝	27½
No. 1 blanket	25	25⅛	25⅛	25½	25⅝	25⅛	25⅛	....	25⅛	25½	26⅛	26⅛	26⅛	26¼	26	25⅞	26⅛	25⅛	25⅝	25¼	26⅜	26½	26⅜	26⅜
No. 2 blanket	24	24½	24½	24⅝	24⅝	24⅜	24½	....	24⅝	24⅝	25⅜	25⅛	25⅛	25¼	25	25	25	25¼	25⅛	25⅛	25⅜	25½	25½	25½
No. 3 blanket	23½	23¾	24	24	23⅞	24⅛	24	....	24	24¼	25	24¾	24¾	24⅞	24¾	24¾	24¾	24¾	24⅝	24⅝	24¾	25⅛	25½	25½
Thin, clean brown	24½	24⅜	24⅞	24⅞	25	24½	24½	....	24⅝	25	25½	25½	25	25	25	25	25⅛	25	25¼	25¼	25½	25¾	25⅜	25⅜
Specky brown	23⅝	24	24	24½	24½	24½	24	....	24	24½	24⅝	24⅜	24⅜	24½	24½	24⅝	24⅝	24¾	24⅝	24¾	25	25¼	25	25
Rolled brown	24	24	24⅛	24⅜	24⅜	24	24½	....	24¾	24¾	25¼	25	25	25	25	24⅞	24⅞	24⅞	25	25	25½	25⅜	25⅜	25⅞

*Holiday.

Plantation Rubber Exports from Dutch East Indies

Java and Madura

To—	August		Eight Months Ended August	
	1922 Kilos	1923 Kilos	1922 Kilos	1923 Kilos
Netherlands and Netherlands f. o.	180,000	272,000	2,655,000	2,057,000
England	147,000	419,000	3,459,000	3,494,000
Germany	130,000	50,000	768,000	220,000
France	46,000	70,000	171,000	385,000
Belgium	.....	.....	11,000	.....
Italy	38,000	22,000	108,000	204,000
Canada	.....	.....	.....	54,000
United States	1,507,000	758,000	11,290,000	13,819,000
Singapore	258,000	88,000	1,997,000	1,081,000
Japan	36,000	53,000	106,000	258,000
Australia	.....	3,000	93,000	157,000
Total	2,342,000	1,735,000	20,658,000	21,729,000
Ports of Origin:				
Tandjong Priok	1,047,000	678,000	8,376,000	8,743,000
Cheribon	.....	.....	22,000	55,000
Samarang	89,000	196,000	482,000	1,594,000
Soerabaia	1,012,000	506,000	10,299,000	8,401,000
Tjilatjap	97,000	37,000	610,000	335,000
Banjoewangi	67,000	15,000	346,000	591,000

Belawan-Deli

To—	August		Eight Months Ended August	
	1922 Kilos	1923 Kilos	1922 Kilos	1923 Kilos
Netherlands and Netherlands f. o.	93,000	264,000	980,000	1,266,000
England	233,000	545,000	1,038,000	1,950,000
Germany	55,000	10,000	424,000	120,000
France	25,000	15,000	61,000	80,000
Belgium	.....	84,000	37,000	171,000
Italy	.....	51,000	22,000	195,000
United States	2,112,000	1,912,000	12,928,000	16,877,000
Penang	3,000	75,000	24,000	351,000
Straits	.....	.....	.....	152,000
Singapore	189,000	105,000	2,067,000	1,861,000
Japan	.....	.....	10,000	.....
Hongkong	.....	.....	.....	9,000
Australia	.....	.....	503,000	1,000
South America	.....	.....	26,000	.....
Total	2,710,000	3,061,000	18,120,000	23,033,000

British Malaya Rubber Exports

An official report from Singapore states that the gross exports of rubber from British Malaya in the month of October, 1923, amounted to 21,424 tons (47,991,100 pounds); the amount of rubber imported was 6,341 tons (14,205,600 pounds); so that net exports amounted to 15,083 tons as compared with 23,472 tons in the corresponding month of 1922.

Appended are the comparative statistics:

	1922		1923	
	Gross Exports Tons	Net Exports Tons	Gross Exports Tons	Net Exports Tons
January	18,962	16,027	22,871	18,513
February	20,033	18,426	19,907	15,818
March	19,304	17,812	23,646	18,538
April	14,400	12,539	24,008	18,619
May	24,789	22,095	20,115	15,095
June	19,617	17,330	18,621	13,664
July	21,964	18,822	16,749	11,125
August	21,316	18,575	19,806	12,764
September	20,238	17,265	21,955	16,685
October	27,466	23,472	21,424	15,083
Totals	208,089	182,363	209,102	155,905

PHILIPPINE IMPORTS OF AMERICAN RUBBER-SOLED SHOES

The Philippine Islands, which during the year 1922 outstripped other nations in the value of their imports from the United States of rubber-soled canvas shoes, will apparently beat their own record during the present year. Beginning in January, 1923, with the small purchase of 11,788 pairs of such shoes, valued at $10,875, they have steadily increased their importations until the total for August stands at 128,800 pairs, valued at $85,764. The total purchase for the first eight months of 1923 is estimated at 569,241 pairs, valued at $410,986, while that for the entire year of 1923 will undoubtedly far surpass that for the corresponding twelve months of 1922, when the figure was 590,207 pairs, valued at $462,501.

The Market for Rubber Scrap

New York

November market conditions in rubber scrap have been exceedingly dull and virtually without sign of betterment, since consuming demand remains wholly negligible. Reclaimers are not in present need of large stocks of scrap. The demand for reclaims serves as a barometer for the rubber scrap trade and at present the situation does not favor immediate and marked scrap price advancement, although strong optimistic views are expressed concerning the immediate outlook.

Virtually all grades of rubber scrap are lower than a month ago, although a few are stationary. The only advances noted are standard white and mixed auto grades.

BOOTS AND SHOES. Prices range downward from $3.00 to $2.87½ a hundred, with demand moderate.

TIRES. Mixed tires are moving in fair volume at prices essentially the same as a month ago.

INNER TUBES. The demand for No. 1 tubes is light and prices slightly depressed compared to those of last month. No. 2 and red have declined rather more than No. 1, the price scarcely rising to $3.00 a hundred.

Other standard grades, such as solid tires, hose, and mechanicals, are without present interests and quotations are nominal.

Quotations for Carload Lots Delivered

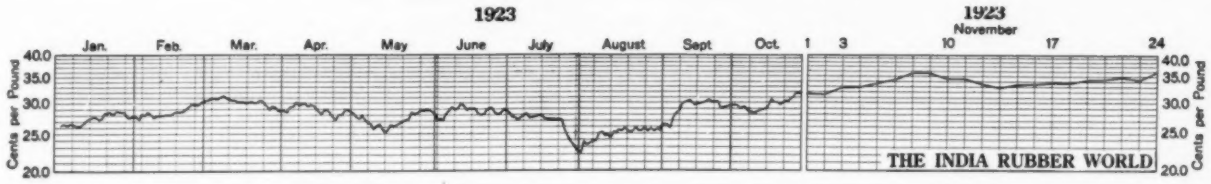
November 24, 1923

Prices subject to change without notice

Boots and Shoes			
Boots and shoes, black	lb.	$0.02⅞ @	$0.03
Trimmed arctics	lb.	.02½ @	.02¾
Untrimmed arctics	lb.	.01½ @	.01⅝
Hard Rubber			
Battery jars, black compound	lb.	.01 @	.01¼
No. 1 scrap	lb.	.07 @	.08
Inner Tubes			
No. 1	lb.	.04 @	.04¼
No. 2	lb.	.02¾ @	.03
Red	lb.	.02¾ @	.03
Mechanicals			
Black scrap, mixed	lb.	.00¾ @	—
Heels	lb.	.00½ @	—
Horse-shoe pads	lb.	.01 @	—
Hose, air brake	ton	16.00	@17.00
regular	ton	13.00	@14.00
Red, scrap, mixed	lb.	.01½ @	.02
White scrap, mixed	lb.	.01½ @	.02
Tires			
PNEUMATIC			
Auto peelings	lb.	.01 @	.01¼
Bicycle	ton	10.00	@12.00
Standard white auto	ton	28.00	@32.00
Mixed auto	ton	13.00	@14.00
Stripped, unguaranteed	ton	10.50	@11.00
SOLID			
Carriage	ton	20.00	@25.00
Irony	ton	10.00	@15.00
Truck, clean	ton	20.00	@25.00

DURING THE TWELVE MONTHS ENDED DECEMBER 31, 1922, THE United States imported 5,229,505 pounds of jelutong (pontianak) valued at $403,812, a considerable increase both in volume and value over that of the twelve months preceding, when such importations totaled only 3,908,401 pounds, valued at $351,893.

BRITISH SOUTH AFRICAN IMPORTATIONS OF AMERICAN SOLES AND heels amounted in value during the entire year 1922 to only $16,564. The purchase of such goods during the month of August only reached the value of $21,901.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The prices of spot middlings during the past month advanced in a series of rapid increases from 31.50 cents on November 1 to practically 36 cents on November 24, punctuated by one or two sharp reactions. The advances are based on actual shortage of the season's crop, due to the ravages of the boll weevil. The government crop estimate as well as those from private sources set the crop at around 10,000,000 bales, or perhaps down to 9,500,000 bales. Cotton is being consumed in this country and exported abroad at a rate which can not be maintained if the crop is not materially larger than at present supposed. A serious shortage is evidently in prospect and corresponding advances are to be looked for. One authority says cotton is now at a price where violent fluctuations may be expected, and the top is probably not yet reached.

EGYPTIAN COTTON. The prices of all stapled cottons have risen in sympathy with the advance in short cottons. Egyptians have been much more active than domestic staples both in this and the foreign markets. Prospective shortage of domestic staples and the wide margin that has existed over a long period in favor of Egyptian cottons are factors that have made possible the advance in Egyptians. Medium Sakellaridis for prompt shipment was quoted November 21 at 48⅜ cents; Medium Uppers, at 44¼ cents.

Cotton Fabrics

TIRE FABRICS. The fabric situation remains very unsettled, due to the spectacular advances in cotton, the backward tire season, and probably other conditions. The opportunity of a short time ago to cover at what now prove to be very low prices was generally missed by tire makers. After the spring dating is over sellers expect commitments will be placed for next year. Such business, it is believed, will not extend over more than 60 to 90 days at a time.

There has been request for fair quantities of low grade builder fabric for non-guaranteed tires.

DUCKS, DRILLS AND OSNABURGS. Stocks are moderate and consumers' interest small due to high prices and continued slackness in the mechanical rubber goods trade for ducks, drills and osnaburgs. More activity in the fabric market is confidently expected with the approach of the turn of the year and gain in orders for hose and other rubber goods for next season.

SHEETINGS. Sheetings have not been in active movement the past month, interest of consumers in the rubber industry being at low ebb on the matter of commitments under present conditions. Purchases are routine for current needs.

MERGER OF NORTHERN AND SOUTHERN COTTON MILLS

Directors of the International Cotton Mills have recently approved plans for the formation of a large cotton manufacturing company to be called New England Southern Mills. The present International (Massachusetts) corporation will be retained but the name will be changed to New England Southern Mills.

The new plants include the Lancaster Cotton Mills, Lancaster, S. C.; Fort Mill Manufacturing Company, Fort Mill, S. C.; Eureka Cotton Mills, Chester, S. C.; the Springstein Mills, Chester, S. C.; Pelzer Manufacturing Company, Pelzer, S. C., Tucapau Mills, Tucapau, S. C., and the Stark Mills, Hogansville, Ga. The products to be manufactured include tire fabrics and various fabrics used by the rubber industry.

New York Quotations

November 24, 1923

Prices subject to change without notice

Drills

38-inch 2.00-yard	yard	$0.28 @
40-inch 3.47-yard		.16⅜ @
52-inch 1.90-yard		.30⅜ @
60-inch 1.52-yard		.37⅞ @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	yard	.29 @
40-inch 1.47-yard		.38⅞ @
72-inch 16.66-ounce		.60 @
72-inch 17.21-ounce		.63½ @

MECHANICAL

Hose	pound	.56 @
Belting		.55 @

TENNIS

51-inch 1.35-yard	yard	.43¼ @

Osnaburgs

40-inch 2.35-yard	yard	.23⅞ @
40-inch 2.48-yard		.22⅝ @
40-inch 3.00-yard		.19 @
37¼-inch 2.42-yard		.23⅛ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	$0.14½ @
Bombazine 60 x 48		.13½ @
Cashmeres 36-inch, tan		.70 @
Plaids 60 x 48		.14 @
Plaids 56 x 44		.13½ @
Surface prints 60 x 48		.14½ @
Surface prints 64 x 60		.15¼ @

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.19 @ .19¼
48 x 48, 2.85-yard		.17 @ .17¼
64 x 68, 3.15-yard		.16¾ @ .17
56 x 60, 3.60-yard		.14½ @ .14¾
48 x 44, 3.75-yard		.14 @ .14¼

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.10⅝ @
40 x 40, 6.15-yard		.08¾ @

Silks

Canton, 38-inch	yard	$0.37½ @
Sateens, 39-inch	lb.	.28½ @

Tire Fabrics

BUILDING

17¼-ounce Sakellaridis, combed	pound	@
17¼-ounce Egyptian, combed		@
17¼-ounce Egyptian, carded		.66 @ .70
17¼-ounce Peeler, carded		.67 @

CORD

Egyptian, combed	pound	@
Egyptian, carded		†.70 @ .72
Peeler, carded		†.64 @ .68

BREAKER

Leno, Peeler, carded		†.60 @ .62

CHAFER

9¼-ounce Egyptian, carded	pound	†.68 @
9¼-ounce Peeler, carded		†.66 @

†Nominal.

The Cotton Outlook

The Depreciation of Sakellaridis

THE margin which normally exists between middling and long staple cotton is being greatly narrowed in Egyptian as it has been in American grown varieties, owing to the decreasing demand for the longer stapled material. E. H. Mulock, British commercial agent for Egypt, places the normal difference between the fully good fair grade of Sakellaridis and Ashmouni, the two chief Egyptian varieties, at 10 to 12 tal. per cantar for both spot and futures, and points to its decline to 2 and 3 tal. in February and March. An even more serious development for Egyptian growers is the narrowing premium between Sakellaridis and American middling, which during 1922 dropped in pence per pound at Liverpool from 9.11*d.* in January to 2.40*d.* in December.

The effect of this state of affairs on the economic situation of Egypt, states Mr. Mulock, will be far-reaching if it tends to increase the cultivation of Ashmouni and shorter staple cottons on a considerable scale at the expense of Sakel, which can only hold its own with its more prolific Egyptian rivals so long as the margin of price is commensurate with the difference in yield per feddan (acre). Diminished cultivation of Sakel is therefore a contingency that must be envisaged and may have to be faced as a result of a persistent lack of demand or at best a fitful or unremunerative demand for this variety of cotton, which although only introduced for the first time in 1911 has so far virtually superseded all other varieties, and assured Egypt's unchallenged supremacy as a producer of cotton for the finer counts. The average for all Egyptian cotton growing areas in 1917-21 of the percentage of the total devoted to Sakel was 71.5; in 1922 this stood at 75.4, and in 1923 at 73.1.

The total acreage of Egyptian cotton, as reported by the Alexandria General Produce Association is 1,588,100 feddans, against 1,465,146 last year and 1,291,878 the year before. Of this year's acreage, 1,162,036 feddans are in Sakel.

Breeding Colored Cotton

In the past twenty years A. W. Brabham, of Olar, South Carolina, has produced twenty different shades of cotton, and hopes soon to reach the goal of a black cotton with seed so perfected that colored cotton can be grown on a commercial scale.

The various shades of cotton thus far produced all hold their color well and have the appearance of having been dipped in dyes. The lint of the colored cotton is exceptionally soft.

United States Cotton Statistics

Census Bureau statistics show that cotton consumed during October totaled 541,825 bales of lint and 57,128 of linters, compared with 483,852 of lint and 49,587 of linters in September of this year, and 533,744 of lint and 62,635 of linters in October, last year. Consumption was larger during October than in any month since last June, but for the first three months of the cotton year it was about 37,000 bales less than during that period last year. In view of the prevailing high price of cotton and its possible effect on the operation of mills, such figures have a special interest at this time.

Cotton on hand October 31, in consuming establishments, totaled 1,102,583 bales of lint and 87,515 of linters, compared with 773,173 of lint and 92,810 of linters on September 30, this year, and 1,381,945 of lint and 82,403 of linters on October 31, last year. In public storage and at compresses there were 3,485,839 bales of lint and 35,810 of linters, compared with 2,147,830 of lint and 22,197 of linters on September 30, this year and 4,287,119 of lint and 16,708 of linters on October 31 last year. Total cotton on hand October 31 was somewhat over 1,000,000 bales less than a year ago.

Imports during October totaled 7,815 bales compared with 6,608 in September this year and 26,816 in October last year.

Exports during October totaled 781,722 bales, including 3,938 bales of linters compared with 689,435 including 3,742 of linters in September this year and 798,664 bales, including 1,535 of linters in October last year. Exports for October exceeded those of September by 92,000 bales, and for the first three months of the cotton year 275,000 bales more were exported than in the same period last year.

European cotton takings were heavy this fall on commitments made before the recent sharp price advance occurred. European stocks during the summer were allowed to reach a low point, and the latter buying has represented replacements rather than any increase in output of cotton goods overseas. Just how the higher price of raw cotton is going to affect consumption remains uncertain. Some curtailment will probably occur, but the relation of this to the reduced crop cannot yet be foreseen.

Cotton spindles active during October numbered 34,378,662, compared with 33,929,885 in September this year and 33,837,435 in October last year. Cotton-growing States had the largest number of active spindles on record during October. Cotton ginned up to November 1 was 7,544,587 bales. For the corresponding period last year the figure was 8,129,215 bales, and this though the total for the entire season was 9,720,306 bales.

Spinners' takings to date have been about 800,000 bales less than last year.

Raw Cotton Situation

The forecast of the Department of Agriculture issued on November 2, as of October 25, places the condition of the American cotton crop at 47.8 per cent, indicating a total production of about 10,248,000 bales. This is only 284,000 bales greater than the crop of the previous year, although the planted acreage was far greater. It is significant to contrast this with the annual average yield for the past three years, which has been 9,321,000 bales; with that of the previous three years, which was 12,300,000 bales; and with that of the fourteen years prior to 1922-23, which was 12,186,570 bales. The poor showing is attributed to unfavorable weather and labor conditions and boll weevil and leaf worm depredations.

Meanwhile world consumption has for several years been going on at a rate substantially in excess of world production, and stocks have been so badly depleted as to prevent the cotton manufacturing industry of the world from resuming normal operations. From 9,350,000 bales at the end of the cotton season three years ago the American carryover was reduced to 3,100,000 bales on July 31 of this year and is estimated at only 700,00 bales on that date next year. Two years ago the world raised about 14,700,000 bales of cotton and last year 17,600,000 or a total of only 32,300,000. During those two years, with foreign cotton mills curtailing extensively, the world consumed some 40,000,000 bales and drew on world reserves to the extent of almost a full American crop. Had foreign mills run full time, world consumption would perhaps have reached 46,000,000 bales and the deficit 14,000,000. At least 22,000,000 or 23,000,000 bales of cotton are needed to keep the world's 156,000,000 spindles operating on a normal basis, and the 18,750,000 to 19,000,000 bales which it is estimated will be produced this year will be sufficient to keep only 125,000,000 to 130,000,000 of them employed.

It is obvious, therefore, that with high cotton and short supplies producing costs for finished goods which it is difficult to persuade wholesale and retail buyers that the public will accept, the cotton manufacturing industry faces a perplexing winter. Apparently

cotton must remain high enough to force a considerable curtailment, but whether present prices are high enough to do this it is impossible to foretell.

Very small yield per acre at high cultivation costs, said to average 29 cents per lint pound of all grades, and not fully compensated for in advanced prices, has placed southern cotton growers in a serious financial situation and presents a serious problem for southern planters to solve. At the national convention of the American Cotton Association, held in October at Columbia, South Carolina, several remedial measures were urged. Chief among them were reduced acreage and intensified culture in order to avert cotton production at an economic loss, and greater diversification of crops, not only to make farming self-sustaining but as a check on boll weevil ravages. A campaign is being organized for obtaining uniform laws on cotton production, warehousing, rural credits and standardization of farm products in Southern States as a means of obtaining greater efficiency in growing and marketing crops and to insure greater stability in prices.

Cotton Notes

The latest estimate for the entire cotton yield for 1923 in the Pacific-Southwest, which includes the Imperial Valley in California and the northern part of Lower California, Salt River Valley and some other sections of Arizona, and some acreage in the San Joaquin Valley, California, is somewhat over 200,000 bales, as compared with 175,000 in 1922. Last year's crop brought almost $20,000,000, but this year's will probably bring nearer $30,000,000. Crop is estimated at 86 per cent normal, and acreage at 230,000.

That cotton-growing in the Pacific-Southwest will steadily increase is assured by the fact that not only are current prices better than those of a year ago, but the world demand is largely in excess of the supply. In this cotton-producing area, one of the greatest in the world potentially, irrigation schemes are being planned that will encourage planting on a largely increased scale. Here the yield per acre is from two to four times that of the old cotton belt in the South, pests are practically as unknown as drought, labor of a superior kind is readily available, and transportation through Los Angeles harbor and the Panama Canal is cheap.

Metal Market Review

New York

None of the markets showed particular activity during the early part of November, but with the announcement by a leading organization of an extra dividend prices in general during the last part of the month took an upward turn. This was particularly true in the case of copper, although a decline has now followed the somewhat spectacular rise. Leading steel mills have been recently increasing their output, while one important interest says that October sales exceeded those of September and that those of November are likely to show still further gains. The general belief seems to be that few price changes of any importance are likely for the balance of the year. The credit situation is regarded as essentially sound, and business activities will remain in normal condition for some time to come, according to experienced market observers.

ALUMINUM. Although the market continued dull during the early part of November all plants handling this metal are making preparations, due to reported foreign competition, for a greatly increased demand next year. The market held firm throughout the month, with prices quoted from 25 to 26 cents a pound. There was a slight improvement in demand noted, due to closed car construction needs.

ANTIMONY. The antimony market during the last part of November was less firm, due to a scarcity in China. No shipments from the Far East have been quoted for several weeks. Prices up to 9 cents have been paid for shipment from Europe, and there was a sharp gain in price about the middle of the month.

COPPER. Following the lowest prices for copper recorded in many months, a slight change for the better appeared about the first of November, and prices continued to advance steadily during the first three weeks. In the buying of American copper both foreign and domestic consumers participated, while an important part was taken by the automotive industries. A reaction followed during the last of the month, but the outlook for the future is encouraging, with extensive expansion programs planned by various organizations.

LEAD. The American market for lead is said to be at present entirely independent of any foreign quotations, and the latter are so much lower than those prevailing here that they have no effect either from an export or import point of view. During the first part of November lead prices remained unchanged, although there was a drastic decline in the London market and a decided shrinkage of imports into the United States from Mexico. As Europe continued during the early part of November to absorb Mexican and Canadian supplies, the domestic producers had the American market to themselves. A firm tone characterized the lead market throughout November.

NICKEL. Shot and ingot nickel were quoted during November at practically unchanged prices, at 29 to 32 cents a pound, with electrolytic nickel held at 32 cents by the leading producers. In the outside market both shot and ingot nickel are quoted at 29 to 32 cents.

STEEL. Present conditions in the steel industry, which are only fluctuating and temporary, are not regarded as discouraging by leading steel men of Pittsburgh and elsewhere. A better tendency, too, has been evident during the last of the month, partly due to improvement in the railway situation and the expectation of growing Japanese purchases. It is said that the industry requires the absorption by foreign sources of only about 10 per cent of production, as to all appearances the domestic market can easily digest the rest of the normal output. One important mill is operating at capacity, notwithstanding the seasonal curtailment in the automobile industry. In general, a better view is taken of prospects for 1924, as the total of railroad cars being planned for grows and the building and automobile outlook continues favorable.

TIN. A sharp gain was made in the price of tin during the first part of November, and prices were maintained through the middle of the month. Then a decline began, and prices became fluctuating and more or less uncertain. October imports were 6,855 tons, making the total for the first ten months 58,532 tons.

ZINC. Prices advanced during the first week of November, and by the middle of the month an increase of 10 points had been made, but with only moderate buying. The market continued steady through the month, zinc makers believing that it was their turn to enjoy higher prices, following recent advances in tin, copper, and lead. Production in October amounted to 42,098 tons, contrasted with 39,105 tons in the preceding month, an increase of 2,993 tons. Although this production was nearly 10,000 tons in excess of domestic shipments, the market became firmer and prices higher.

Basic Metals

November 23, 1923

	Cents per pound
Aluminum, 98 to 99 per cent pure	25.50 @ 26.00
Antimony	8¼ @ 9 *
Copper:	
Lake, spot	13⅛ @ 13¼
Electrolytic, spot	13 @ 13⅛
Casting	12¾ @ ..
Lead, spot, New York	6.85 @ 7.00
Lead, spot, East St. Louis	6.60 @ 6.65
Nickel, ingot	29 @ 32
Tin, spot	44⅜ @ ..
Zinc, spot, New York	6.60 @ 6.65
Zinc, spot, East St. Louis	6.25 @ 6.30

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

	Cents per Pound
Bright basic	4.75 @ 5.00
Annealed soft	4.75 @ 5.00
Galvanized annealed	5.40 @ 5.68
Coppered basic	5.40 @ 5.65
Tinned soft Bessemer	6.40 @ 6.65

*Regular extras for lighter gage.

The Market for Chemicals and Compounding Ingredients

New York

THE market conditions for chemicals and compounding ingredients are quiet and steady. Manufacturers are refraining from placing contracts for materials for future use, buying only for current needs in view of the general restrictions of activity observable in many industrial lines.

ANILINE. Consumption is affording a steady demand. Stocks are in good volume. The tone of the market, however, lacks firmness.

ASBESTINE. In the mechanical rubber goods line asbestine is very nearly as staple as whiting and the demand for it affords the same seasonal and routine movement. The outlook is good for the better grades, which are of especial interest in rubber work.

BARYTES. Owing to the competition of imported barytes a reduction of $2.00 a ton was made in the corresponding domestic grades. The movement of stock is reported steady and in seasonal volume.

BENZOL. Reduction in prices several weeks ago did not greatly stimulate sales of this material, although consumers trade has increased in the interval to liberal proportions. The stocks of benzol are declining somewhat from normal and prices are firmer.

BLANC FIXE. General conditions are much the same as regards demand as in the case of barytes, although there has been no reduction in prices. Trade is about normal in volume.

CARBON BLACK. All quotations are nominal and the market conditions in confusion. The fact that the tire trade has for some time not been absorbing its customary amount of this material has also seriously depressed the price. Although carbon black production has been increased and prices are not far above the cost of manufacture, a much greater increase in production is due within the next six or eight months. The market began to decline before the increased production became evident. The new production is reported seeking an outlet at any price. The market is considerably demoralized. As low as 7½ cents a pound has been named for carload lots.

CHINA CLAY. The rapidly extending popularity of hard clay as a compounding ingredient in rubber goods maintains a good outlet for this material even in the tire trade, where it is showing up well as affording good tensile and wearing properties. The inception of the use of hard clay as a rubber compounding ingredient is of American origin and domestic grades lead in popularity for rubber purposes.

DRY COLORS. In dry colors competition is very active and the market is somewhat unsettled in many colors, especially carbon black.

LITHARGE. The price rules 1¼ cents a pound higher than one year ago. Business is fair.

LITHOPONE. Stocks in makers' hands are small. Prices are protected by makers' guarantee against reduction during the remainder of 1923. Present consumers' requirements continue in large volume and the 1924 outlook is satisfactory.

SOLVENT NAPHTHA. Consumers' needs for this material seem never to slacken, consequently the stock available is always light. Prices hold steady as a result of these conditions.

SULPHUR. Good interest is noted in the sulphur trade, with steady seasonal outflow of the material into its many uses, including rubber manufacturing.

TALC. The utilization of talc, both domestic and foreign grades, has been on a liberal scale the present year. Prices are little changed as the movement takes on its seasonal aspects.

WHITING. There is never a flurry in whiting. The supply seems as reliable as the quality of the material itself and flows on in routine volume with seasonal fluctuations at steady prices.

ZINC OXIDE. Tire makers have been making purchases very cautiously and moderately, although after the turn of the year their interest is due to increase. In fact, indications have already been noted of coming improvement of trade from this source.

New York Quotations

November 24, 1923

Accelerators, Inorganic			
Lead, carbonate	lb.	$0.09¼	@
Lead, red	lb.	.10⁹⁄₁₀	@
sublimed blue	lb.	.08¾	@
sublimed white	lb.	.08¾	@
Lime, flour	lb.	.02½	@
R. M. hydrated	ton	15.00	@
superfine	lb.	.01½	@ .02
Litharge, domestic	lb.	.10½	@ .11
imported	lb.	*.17	@
Magnesia, carbonate, light	lb.	.07¼	@
calcined, light (bbls.)	lb.	.23	@ .24
calcined, ex. light (bbls.)	lb.	.40	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.04½	@ .06
Orange mineral A.A.A	lb.	.13⁹⁄₁₀	@
Rubber lead	lb.	.10	@
Sulsin, ton lots	lb.		@
less ton lots	lb.		@
Accelerators, Organic			
A-7	lb.	.75	@ .85
A-19	lb.	.85	@ .95
Accelemal	lb.	.35	@
Accelerene (f. o. b. English port)	lb.	13s.	@
Aldehyde ammonia powder	lb.	.95	@
Aniline (f. o. b.) factory	lb.	.16½	@ .18
sulphate	lb.	.33	@ .35
Cryline	lb.	.60	@
Diphenyl diamino carbazol	lb.	.40	@
Diphenylguanidine	lb.	1.10	@ 1.25
Ethylidene aniline	lb.	.70	@ .75
Excellerex	lb.	.40	@ .45
Formaldehyde aniline	lb.	.47½	@
H. R.	lb.	1.40	@ 1.50
Hexamethylene tetramine	lb.	.85	@
Lead oleate (bbls.)	lb.	$0.16	@
Methylene aniline	lb.	.36	@ .42
No. 999	lb.	.15	@
Paraldehyde	lb.	.17	@ .19
Para-nitros-dimethyl aniline	lb.	.35	@
Paraphenylene diamine	lb.	1.40	@ 1.45
Quinodine	lb.	.55	@
Super-sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .35
Super-X	lb.	.30	@
Tuads (Tetramethyl thiuram-disulphide)	lb.	6.00	@
Thiocarbanilide	lb.	.26	@ .30
Triphenylguanidine	lb.	.80	@
Vul-Ko-Cene	lb.	.35	@
Acids			
Acetic 28% (bbls.)	lb.	.04¼	@
glacial (carboys)	lb.	.14¾	@
Cresylic (95% straw color)	gal.	.78	@
(95 dark)	gal.	.74	@ .80
Sulphuric, 66 degrees	lb.	.02	@
Alkalies			
Caustic soda	cwt.	3.00	@ 3.10
flake, 76% (factory)	cwt.	3.76	@ 3.91
solid, 76% (factory)	cwt.	3.15	@
Colors			
BLACK			
Bone, powdered	lb.	.05½	@ .07½
Carbon black	lb.	.11	@ .16
pressed	lb.	.12	@ .17
Drop	lb.	.07½	@ .10
Gritless black	lb.	.40	@
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.13	@ .16
Micronex	lb.	.12	@ .17
Shawinigan	lb.	.16	@ .18
BLUE			
Cobalt	lb.	$0.21	@ $0.26
Gritless blue	lb.	3.50	@
Prussian	lb.	.55	@ .60
Ultramarine	lb.	.15	@ .35
T. K.	lb.	.25	@ .30
BROWN			
Iron oxide	lb.	.04½	@ .05½
Sienna, Italian	lb.	.06	@ .07½
Umber, Turkey	lb.	.05½	@ .06¾
GREEN			
Chrome, light	lb.	.28	@ .31
medium	lb.	.30	@ .35
dark	lb.	.32	@ .43
commercial	lb.	.12	@
tile	lb.	.13	@ .15
Gritless green	lb.	3.50	@
Oxide of chromium	lb.	.39½	@ .55
T. K.	lb.	.40	@ .50
RED			
Antimony, crimson	lb.	.45	@
crimson T. K.	lb.	.40	@ .50
crimson, 15/17% free	lb.	.39	@
crimson, R.M.P. No. 3	lb.	.50	@
crimson F.	lb.	.35	@ .45
Antimony, golden	lb.	.25	@
golden T. K.	lb.	.17	@ .38
golden R.M.P. No. 7	lb.	.21	@
golden, 15/17% free	lb.	.19	@ .22
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.20	@
Antimony			
Tideco, golden	lb.	.22	@ .52
7-A	lb.	.35	@
Vermilion, 5% F. S.	lb.	.65	@
Vermilion 15/17% F.S.	lb.	.50	@
T. K.	lb.	.50	@ .55
Arsenic sulphide, red	lb.	.14¼	@
Gritless red (four shades)	lb.	3.50	@
purple	lb.	2.50	@

*Nominal.

Colors—*Continued*

Indian maroon, English	lb.	$0.11½ @	$0.12
Iron oxide, domestic	lb.	.08 @	.12
English	lb.	.12 @	.14
pure bright	lb.	.12 @	.14
reduced	lb.	.08 @	.11
Spanish	lb.	.03 @	.04½
maroon	lb.	.08 @	.12
Venetian	lb.	.02¾ @	.05½
Oximony	lb.	.16 @	
Pará toner	lb.	1.00 @	1.10
Toluidine toner	lb.	2.20 @	2.75
Vermilion, English	lb.	1.20 @	1.35
WHITE			
Albalith	lb.	.07 @	.07½
Aluminum bronze	lb.	.55 @	.60
Lithopone, domestic	lb.	.06 @	.07½
Azo	lb.	.07 @	.07½
Red Seal, imported	lb.	.07 @	.07½
Titanium oxide T. O. Pigment	lb.	.16 @	.16½
Zinc oxide:			
French process, Florence brand			
Green seal	lb.	.10¼ @	.11¼
Red seal	lb.	.09¾ @	.10¼
U. S. P.	lb.	.16 @	.18
White seal	lb.	.12 @	.12¾
Horse Head brands			
Selected	lb.	.08½ @	.09
Special	lb.	.08½ @	.09
XX red	lb.	.08 @	.08½
Leaded brands			
Lehigh	lb.	.07¼ @	.07¾
Standard	lb.	.07¼ @	.07¾
Sterling	lb.	.07¼ @	.07¾
Superior	lb.	.07¼ @	.07¾
Palmerton process			
Kadox, black	lb.	.09¾ @	.10¼
blue	lb.	.09½ @	.10
red	lb.	.09¾ @	.09¾
Snow white	lb.	.13 @	
Azo (factory):			
ZZZ (lead free)	lb.	.08 @	.08½
ZZ (—5% leaded)	lb.	.07½ @	.07¾
Z (8.10% leaded)	lb.	.07¼ @	.07¾
YELLOW			
Arsenic	lb.	.75 @	1.00
Chrome	lb.	.21 @	
Gritless yellow	lb.	3.50 @	
India rubber	lb.	.75 @	
Ochre, domestic	lb.	.02 @	.02½
imported	lb.	.03 @	.03½

Compounding Ingredients

Aluminum flake (carloads)	ton	29.00 @	
filler	ton	23.00 @	
hydrate, light	lb.	.18 @	.20
Ammonia carbonate	lb.	.09¼ @	.10½
Asbestine	ton	20.00	25.00
Aluminum silicate	ton	22.50	@25.00
Barium, carbonate, precip.	ton	80.00	@90.00
dust	lb.	.05 @	.06
Barytes, imported	ton	60.00 @	
pure white C. L.	ton	23.90 @	
off color	ton	20.00 @	
uniform floated	ton	23.90 @	
water ground and floated	ton	26.00	@30.00
Basofor	lb.	.04¼ @	
Blanc fixe	lb.	.04 @	.04¼
Carrara filler (factory)	lb.	.01¾ @	
Chalk, precip. extra light	lb.	.04¼ @	.05
heavy (f.o.b. factory)	lb.	.03¼ @	.04
China clay, Dixie	ton	20.00	@35.00
Blue ribbon (carloads)	ton	14.00 @	
Blue Ridge	ton	12.00	@26.00
L. H. B. (carlots)	ton	12.00	@13.00
Tideco (factory)	ton	10.00 @	

* Nominal.

Chemical Market—*Continued*

New York Quotations

November 24, 1923

Cotton flock, black	lb.	$0.12 @	
light-colored	lb.	.13 @	.14
white	lb.	.14½ @	.21
Cotton linters clean mill-run	lb.	.07½ @	
Fossil flour (powdered)	ton	60.00 @	
(bolted)	ton	60.00 @	
Glue, high grade	lb.	.30 @	.40
medium	lb.	.20 @	.26
low grade	lb.	.15 @	.18
Graphite, flake	lb.	.06½ @	.12
amorphous	lb.	@	
Infusorial earth (powd.)	ton	60.00 @	
(bolted)	ton	65.00 @	
Lime (bolted)	ton	.02 @	
Mica, amber	lb.	.05 @	
powdered	lb.	*.15 @	
white	lb.	.06 @	
Pumice stone, powdered	lb.	.03 @	.05
Rotten st., powd. (bbls.)	lb.	.02½ @	.04½
Slate flour	ton	8.00	@11.00
Soap bark, cut	lb.	.08½ @	.10
Soapstone, powdered, gray	ton	12.00	@20.00
Sodium bicarbonate (bbls.)	lb.	.02¾ @	
Starch, powd. corn (bags)	cwt.	3.42 @	3.52
(bbls.)	cwt.	3.69 @	3.79
Talc, soapstone	ton	12.00	@20.00
Terra blanche	ton	22.50	@25.00
Whiting, Alba	cwt.	@	
chalk, L. H. B.	ton	18.00	@25.00
Whiting, commercial	cwt.	$1.00 @	
English	ton	20.00 @	
gilders (bolted)	cwt.	1.10 @	
K. T.	ton	@	
Perfection	ton	14.00	@16.00
Quaker	ton	13.00	@22.00
Superfine, L. H. B.	ton	13.50	@22.50
W. T.	ton	20.00 @	
York	ton	12.00 @	
Wood pulp, XXX	ton	35.00 @	
X (f. o. b. factory)	ton	25.00 @	

Mineral Rubber

Genasco (factory)	ton	50.00	@52.00
Gilsonite	ton	65.00	@
Hard hydrocarbon	ton	31.00	@50.00
Liquid rubber	lb.	.14	@
Ohmlac Kapak, K-R	ton	50.00	@60.00
K-4	ton	175.00	@
Parra M. R. flux	lb.	.06 @	.07
Soft hydrocarbon	ton	30.00	@50.00
320/340 M. P. hydrocarbon	ton	45.00	@50.00
300/310 M. P. hydrocarbon	ton	40.00	@45.00
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	52.00	@54.00
Robertson, M. R., solid	ton	35.00	@75.00
M. R. granular (factory)	ton	42.00	@80.00
Rubrax (factory)	ton	60.00 @	
Synpro, gran. M. R. (fac.)	ton	55.00 @	

Softeners

Avoilas compound	lb.	.13 @	
Castor, No. 1, U. S. P.	lb.	.13¾ @	
No. 3, U. S. P.	lb.	.13¼ @	
Corn	lb.	.12½ @	
Cotton	lb.	.13 @	.15
Cycline	gal.	.35 @	.38
Glycerine	lb.	.17 @	.17½
Linseed, raw	gal.	.90 @	
Palm lagos	lb.	.09½ @	.10
oil clarified	lb.	.10 @	.10½
Palm, niger	lb.	.09 @	
Peanut, crude	lb.	.13 @	
refined	lb.	.16 @	
Petrolatum, standard	lb.	.06 @	.08
Petrolatum, sticky	lb.	.08 @	.10
Pine, steam distilled	gal.	.63 @	.65
Rapeseed, refined	gal.	$0.80 @	
blown	gal.	.96 @	
Rosin	gal.	.45 @	.50
Synpro	gal.	@	
Soya bean	lb.	.12 @	
Tar	gal.	.25 @	.27
Woburn	lb.	.04½ @	

Resins and Pitches

Tar, pine, retort	bbl.	11.00	@11.50
kiln	bbl.	11.50	@12.50
Pitch, Burgundy	lb.	.05 @	
coal tar	lb.	.01½ @	
Fluxol hardwood	lb.	.02 @	.04
pine tar	lb.	.03 @	
ponto	lb.	.07½ @	
Rosin, K (bbl.)	280 lbs.	6.25 @	
strained (bbl.)	280 lbs.	6.20 @	
Shellac, fine orange	lb.	.75 @	*.90
substitute	gal.	2.00 @	

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	.25 @	.25½
Benzol (90% drums [7.21 lbs. per gal.])	gal.	.28 @	.33
pure (drums)	gal.	.34 @	
Carbon bisulphide (dms. [10.81 lbs. per gal.])	lb.	.06½ @	.07½
tetrachloride (drums, [13.28 lbs. per gal.])	lb.	.09½ @	.10½
Hartol No. 303			
Tankcars	gal.	.20 @	
Drums, carlots	gal.	.23 @	
Drums, less carlots	gal.	.26 @	
Motor gasoline (steel bbls.)	gal.	.15½ @	
Naphtha, V. M. & P.	gal.	.14½ @	
solvent (drums extra)	gal.	.26½ @	
68° grav.	gal.	.16 @	
70° grav.	gal.	.17 @	
71° grav.	gal.	.18 @	
Cymene (factory)	gal.	1.50 @	
Toluol, pure (7.21 lbs. per gal.)	gal.	@	
Turpentine, spirits	gal.	.98 @	
wood, steam distilled	gal.	.90 @	

Substitutes

Black	lb.	.09 @	.14
Brown	lb.	.10 @	.15
White	lb.	.09½ @	.16
Brown factice	lb.	.08 @	.12½
White factice	lb.	.09 @	.14½
T. K., various	lb.	.14 @	.18

Vulcanizing Ingredients

Black hypo, T. K., S. F.	lb.	.18 @	
13% F. S., L. H. B.	lb.	.20 @	
Sulphur chloride	lb.	.04 @	.13½
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.60 @	2.95
(bags)	cwt.	2.35 @	2.65
Sulphur, Bklyn bd. (bbls.)	cwt.	2.75 @	3.30
superfine com. (bgs.)	cwt.	2.00 @	2.50
(bbls.)	cwt.	2.40 @	2.90
Rubber makers	lb.	.03½ @	

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.40 @	.45
ceresine, white	lb.	.10 @	.12
carnauba	lb.	.19 @	
montan	lb.	.06 @	.06½
crokerite, black	lb.	.18 @	.24
green	lb.	.27 @	.28
sweet wax	lb.	.12 @	

Paraffin

122/124 white crude scale	lb.	.03½ @	
124/126 white crude scale	lb.	.03¼ @	
120/122 fully refined	lb.	.03¾ @	
125/127 fully refined	lb.	.04¼ @	

SECOND NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING

Manufacturers and executives connected with all industries should be interested in the coming Second National Exposition of Power and Mechanical Engineering which will be held at Grand Central Palace, New York, N. Y., December 3-8, 1923. At the various sessions of the exposition such subjects will be considered as the latest developments in fuel-burning apparatus; the importance of fuel economy in power utilization and generation; recent advances in material-handling equipment, including conveyors of all kinds; as well as many other new ideas of interest to executives as well as to plant engineers. A program of motion pictures illustrating important processes of manufacture as connected with certain industries will be one of the features. Included among the exposition exhibitors are the following organizations: American Chain Co., American Schaeffer & Budenberg Corporation, American Steam Gauge & Valve Manufacturing Co., Bristol Co., The Falk Corporation, Mason Regulator Co., Racine Tool & Machine Co., Smith & Serrell, C. J. Tagliabue Manufacturing Co., Yarnall-Waring Co., Pittsburgh Valve Foundry & Construction Co., and Peerless Machine Co.

THE TORONTO PLANT MAINTAINED BY THE GOODYEAR TIRE & Rubber Co. of Canada, Limited, is now running two shifts and turning out an average of 2,300 automobile tires a day in addition to truck and motorcycle tires. The second plant at Bowmanville, Canada, is also handling special work and running twenty-four hours a day. C. H. Carlisle is vice president and general manager.

ENGLAND AND QUEBEC AND ONTARIO CONTINUE TO BE THE leading purchasers of American-made miscellaneous rubber goods, the amount taken in August by the former being estimated at $83,705, while that of the latter is given as $55,289.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Cametá
OCTOBER 12. By "Hubert," Manáos.					
Paul Bertuch	58,091	.....	.....	11,640	.....
OCTOBER 25. By "Linnell," Pará.					
Meyer & Brown, Inc.	67,200	.....	13,440	35,840	.....
OCTOBER 30. By "Pan-American," Montevideo.					
Paul Bertuch	14,328	.....	203	.....	.....
NOVEMBER 3. By "Sallust," Manáos.					
H. A. Astlett & Co.	49,700	.....	26,300	10,700	.....
Paul Bertuch	143,288	.....	.....	.....	.....
General Rubber Co.	.....	.....	58,240	58,240	.....
L. Littlejohn & Co., Inc.	56,000	8,960	6,720	.....	.....
Poel & Kelly, Inc.	218,630	.....	77,512	.....	11,167

Plantations

	Pounds
OCTOBER 18. By "Bawean," Colombo.	
Hood Rubber Co.	*22,400
OCTOBER 19. By "City of Benares," Colombo.	
H. A. Astlett & Co.	22,400
Baird Rubber & Trading Co., Inc.	56,000
Poel & Kelly, Inc.	44,800
Chas. T. Wilson Co., Inc.	33,600
OCTOBER 20. By "Veendam," Far East.	
L. Littlejohn & Co., Inc.	78,400
OCTOBER 21. By "City of Madras," Singapore.	
H. A. Astlett & Co.	190,600
F. R. Henderson & Co., Inc.	24,060
Hood Rubber Co.	*22,525
Meyer & Brown, Inc.	190,400
H. Muehlstein & Co., Inc.	257,600
Poel & Kelly, Inc.	727,167
Fred Stern & Co., Inc.	50,398
William H. Stiles & Co.	89,600
Chas. T. Wilson Co., Inc.	123,200
Chas. T. Wilson Co., Inc.	*33,600
OCTOBER 23. By "President Van Buren," London.	
F. R. Henderson & Co., Inc.	19,166
OCTOBER 24. By "Barbodian," London.	
F. R. Henderson & Co., Inc.	6,598
OCTOBER 24. By "Talthybius," Singapore.	
H. A. Astlett & Co.	297,920
Baird Rubber & Trading Co., Inc.	78,400
Baird Rubber & Trading Co., Inc.	*22,400
General Rubber Co.	31,016
F. R. Henderson & Co., Inc.	123,115
Hood Rubber Co.	11,200
J. T. Johnstone & Co., Inc.	12,320
L. Littlejohn & Co., Inc.	1 16 ,040
Meyer & Brown, Inc.	920,640
H. Muehlstein & Co., Inc.	275,280
Poel & Kelly, Inc.	832,290
Fred Stern & Co., Inc.	114,507
William H. Stiles & Co., Inc.	190,400
Chas. T. Wilson Co., Inc.	199,360
OCTOBER 25. By "Bengal Maru," Colombo.	
Baird Rubber & Trading Co., Inc.	56,000
Fred Stern & Co., Inc.	11,200
OCTOBER 26. By "Rotterdam," Far East.	
L. Littlejohn & Co., Inc.	33,600
OCTOBER 27. By "Gothic Prince," Far East.	
H. A. Astlett & Co.	347,200
Baird Rubber & Trading Co.	276,640
General Rubber Co.	69,440
F. R. Henderson & Co., Inc.	141,535
J. T. Johnstone & Co., Inc.	26,640
L. Littlejohn & Co., Inc.	344,960
Meyer & Brown, Inc.	754,880
H. Muehlstein & Co., Inc.	291,200
Poel & Kelly, Inc.	647,191
Fred Stern & Co., Inc.	37,424
William H. Stiles & Co., Inc.	358,400
Chas. T. Wilson Co., Inc.	582,500
OCTOBER 31. By "Falls City," Far East.	
L. Littlejohn & Co., Inc.	22,400

*Arrived at Boston.

	Pounds
OCTOBER 31. By "Half Moon," Far East.	
H. A. Astlett & Co.	11,200
Baird Rubber & Trading Co., Inc.	11,200
General Rubber Co.	747,170
F. R. Henderson & Co., Inc.	24,685
J. T. Johnstone & Co., Inc.	24,532
L. Littlejohn & Co., Inc.	210,560
Meyer & Brown, Inc.	112,000
H. Muehlstein & Co., Inc.	11,200
Poel & Kelly, Inc.	418,604
Fred Stern & Co., Inc.	102,422
William H. Stiles & Co.	22,400
Chas. T. Wilson Co., Inc.	67,200
NOVEMBER 2. By "Aukland," Far East.	
Poel & Kelly, Inc.	89,600
NOVEMBER 3. By "Franconia," Singapore.	
Poel & Kelly, Inc.	13,952
NOVEMBER 5. By "Antilochus," Singapore.	
H. A. Astlett & Co.	33,600
Baird Rubber & Trading Co., Inc.	190,400
General Rubber Co.	36,720
Hood Rubber Co.	20,160
J. T. Johnstone & Co., Inc.	49,280
L. Littlejohn & Co., Inc.	327,040
Meyer & Brown, Inc.	327,040
H. Muehlstein & Co., Inc.	212,800
Fred Stern & Co., Inc.	90,276
Chas. T. Wilson Co., Inc.	443,520
NOVEMBER 5. By "City of Boston," Far East.	
H. A. Astlett & Co.	476,000
Baird Rubber & Trading Co., Inc.	11,200
F. R. Henderson & Co., Inc.	3,360
Hood Rubber Co.	78,705
J. T. Johnstone & Co., Inc.	86,240
L. Littlejohn & Co., Inc.	297,920
Meyer & Brown, Inc.	432,320
H. Muehlstein & Co., Inc.	750,400
Poel & Kelly, Inc.	888,352
Fred Stern & Co., Inc.	123,023
Chas. T. Wilson Co., Inc.	414,400
Chas. T. Wilson Co., Inc.	*78,400
NOVEMBER 8. By "Egremont Castle," Singapore.	
Baird Rubber & Trading Co., Inc.	145,600
Baird Rubber & Trading Co., Inc.	*44,800
General Rubber Co.	1,117,190
F. R. Henderson & Co., Inc.	144,985
L. Littlejohn & Co., Inc.	512,200
Meyer & Brown, Inc.	268,880
H. Muehlstein & Co., Inc.	224,000
Fred Stern & Co., Inc.	246,840
Chas. T. Wilson Co., Inc.	481,600
NOVEMBER 9. By "Crewe Hall," Colombo.	
Fred Stern & Co., Inc.	11,200
Hood Rubber Co.	44,800
L. Littlejohn & Co., Inc.	33,600
Poel & Kelly, Inc.	33,650
NOVEMBER 10. By "President Adams," London.	
F. R. Henderson & Co., Inc.	9,161
NOVEMBER 10. By "Grelwen," Singapore.	
Hood Rubber Co.	35,300
Hood Rubber Co.	*67,200
NOVEMBER 10. By "Ryndam," Singapore.	
Baird Rubber & Trading Co., Inc.	56,000
Meyer & Brown, Inc.	67,200
NOVEMBER 12. By "Bellerophon," Singapore.	
H. A. Astlett & Co.	487,200
Baird Rubber & Trading Co., Inc.	179,200
Baird Rubber & Trading Co., Inc.	*44,800
J. T. Johnstone & Co., Inc.	61,600
General Rubber Co.	11,200
F. R. Henderson & Co., Inc.	39,320
L. Littlejohn & Co., Inc.	990,080
Meyer & Brown, Inc.	380,800
Fred Stern & Co., Inc.	169,120
William H. Stiles & Co.	78,400
Chas. T. Wilson Co., Inc.	134,400
NOVEMBER 15. By "Grelwen," Far East.	
Chas. T. Wilson Co., Inc.	67,200
Chas. T. Wilson Co., Inc.	*123,200
NOVEMBER 17. By "Merton Hall," Singapore.	
L. Littlejohn & Co., Inc.	11,200
Fred Stern & Co., Inc.	33,600
NOVEMBER 17. By "New Amsterdam," Rotterdam.	
L. Littlejohn & Co., Inc.	118,720
Meyer & Brown, Inc.	29,120
NOVEMBER 19. By "Clan Maciver," Far East.	
Chas. T. Wilson Co., Inc.	8,960
NOVEMBER 19. By "Veendyk," Belewan.	
L. Littlejohn & Co., Inc.	297,920
General Rubber Co.	410,811
J. T. Johnstone & Co., Inc.	24,640
Fred Stern & Co., Inc.	47,581
NOVEMBER 19. By "Virginia Dollar," Far East.	
L. Littlejohn & Co., Inc.	268,800
Meyer & Brown, Inc.	58,800
Fred Stern & Co., Inc.	145,553

Africans

	Pounds
OCTOBER 21. By "Adriatic," Liverpool.	
Fred. Stern & Co., Inc.	6,463
OCTOBER 25. By "Minnekahda," Hamburg.	
Poel & Kelly, Inc.	102,779

Balata

NOVEMBER 3. By "Sallust," Manáos.	
Paul Bertuch	1,091
L. Littlejohn & Co., Inc.	4,400

Gutta Percha

OCTOBER 27. By "Gothic Prince," Singapore.	
L. Littlejohn & Co., Inc.	56,000

Gutta Siak

OCTOBER 27. By "Gothic Prince," Singapore.	
L. Littlejohn & Co., Inc.	134,400
NOVEMBER 12. By "Bellerophon," Singapore.	
L. Littlejohn & Co., Inc.	22,400

Pontianak

NOVEMBER 8. By "Egremont Castle," Singapore.	
L. Littlejohn & Co., Inc.	135,000
NOVEMBER 12. By "Bellerophon," Singapore.	
F. R. Henderson & Co., Inc.	14,774

Guayule

OCTOBER 25-NOVEMBER 20. By "Railways," Texas.	
Continental Rubber Co.	209,800

United States Crude and Waste Rubber Imports for 1923 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1923	Total 1922	Balata	Miscellaneous	Waste
January ..... *tons*	25,354	1,233	549	61	.....	.....	31,197	21,867	64	257	382
February	21,815	2,004	308	93	.....	.....	24,220	28,973	25	397	684
March	31,673	1,482	742	19	.....	.....	33,916	28,702	124	738	863
April	29,922	1,095	399	30	142	.....	31,588	14,444	40	1,504	507
May	34,609	1,042	333	24	167	9½	36,184½	20,622	55	463	361
June	31,574	1,032	286	42	.....	.....	32,934	15,750	28	771	300
July	17,459	636	146	23	328	17	18,609	25,245	68	436	121
August	18,083	297	88	30	164	12	18,674	21,764	54	1,039	127
September	10,890	542	69	65	15	30	11,611	28,288	164	165	83
October	24,728	410	155	106	263	.....	25,662	.....	99	469	90
Totals, 10 months, 1923. *tons*	250,107	9,773	3,075	493	1,079	68½	264,595½	.....	721	6,239	3,518
Totals, 10 months, 1922.....	219,311	8,158	1,677	51	281	122	.....	229,600	318	3,871	585

Compiled from statistics supplied by the Rubber Association of America, Inc.

Custom House Statistics

New York

Imports of Crude and Manufactured Rubber

	June, 1922		June, 1923	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	11,209	$1,653	11,200	$3,995
France	25	5	155,982	39,388
Germany	.....	.....	357,530	80,164
Netherlands	417,991	57,387	514,474	149,794
England	1,656,820	270,075	9,332,726	2,791,934
Costa Rica	.....	.....	4,257	672
Honduras	.....	.....	145	72
Nicaragua	215	54	9,473	1,386
British West Indies	.....	.....	29,400	2,310
Dominican Republic	.....	.....	2,623	197
Salvador	3,660	750	.....	.....
Newfoundland	250	50	.....	.....
Brazil	1,646,065	195,793	2,247,317	532,044
Chile	.....	.....	1,426	214
Colombia	4,553	630	169,249	52,856
Ecuador	.....	.....	54,056	9,670
Peru	330	40	107,518	53,029
Uruguay	47,157	6,838	60,668	29,722
British India	32,662	5,166	36,853	11,818
Ceylon	12,747,521	1,907,298	4,147,920	1,280,924
Straits Settlements	26,619,852	3,752,319	42,152,740	12,812,237
China	30,000	3,200	.....	.....
Java	2,216,162	375,303	6,940,043	2,077,746
Dutch East Indies	2,736,402	440,511	4,805,357	1,302,337
Hongkong	40,690	6,104	.....	.....
Totals	48,211,564	$7,023,176	71,140,957	$21,232,509
Balata	44,501	25,542	80,483	58,222
Jelutong (Pontianak)	557,282	51,183	913,737	79,894
Gutta percha	298,778	46,107	461,450	81,130
Rubber scrap and reclaimed	35,080	2,147	744,521	114,610
Totals, unmanufactured	49,147,205	$7,148,155	73,341,148	$21,566,365
Chicle	163,723	97,492	160,811	75,468
MANUFACTURED—*dutiable*				
Rubber belting for machinery	.....	.....	6,917	6,645
Other manufactures of rubber and substitutes	5,201	130,149	.....	70,424
Totals, manufactured	5,201	$130,149	6,917	$77,069

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	40,470	$2,995	67,795	$7,173
Scrap and all	544,489	20,688	785,120	45,045
Footwear				
Boots ....*pairs*	20,016	51,853	20,550	55,038
Shoes ....*pairs*	20,103	21,522	45,758	32,722
Canvas shoes with rubber soles ....*pairs*	125,293	91,368	224,017	170,164
Druggists' rubber sundries	51,053	60,251	46,301	46,193
Hard rubber goods				
Battery jars and accessories	19,473	4,712	2,703	560
Other electrical supplies	13,759	6,892	6,522	5,093
Other hard rubber goods	24,835	25,558	46,827	31,666
Tires				
Pneumatic casings				
For automobiles	101,166	1,296,383	115,347	1,260,186
Others	9,391	35,609	8,103	20,895
Pneumatic tubes				
For automobiles	58,665	118,125	93,939	158,178
Others	5,379	6,753	4,860	3,952
Solid tires				
For automobile and motor trucks	3,031	91,705	5,614	129,076
Others	54,640	20,934	41,463	9,275
Tire repair materials	53,874	25,094	61,194	24,357
Belting	86,603	47,340	176,382	101,518
Hose	166,744	61,807	240,652	100,532
Packing	50,000	18,786	87,155	38,305
Soles and heels	100,183	45,517	87,763	34,408
Thread	59,663	73,939	55,963	57,065
Other rubber manufactures	134,082	98,820	259,227	159,776
Totals, manufactured	.....	$2,226,651	.....	$2,491,177

Exports of Foreign Merchandise

UNMANUFACTURED				
Crude rubber	52,503	$6,135	79,119	$18,800
Balata	12,000	6,000	6,367	3,703
Totals, unmanufactured	64,503	$12,135	85,486	$22,503
MANUFACTURED				
Rubber manufactures	.....	.....	100	$91
Totals, manufactured	.....	.....	100	$91

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	July, 1923		Seven Months Ending July, 1923	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	212,073	$43,158	2,530,982	$694,798
Netherlands	158,503	28,747	4,909,757	1,394,451
Portugal	.....	.....	10,748	784
United Kingdom	5,103,032	1,618,526	60,384,072	19,427,802
Canada	1,209	236	40,844	12,569
Central America	106	6	50,429	11,312
Mexico	729	96	121,052	24,461
Brazil	1,391,401	455,975	18,396,270	4,126,494
Peru	20,419	4,676	1,276,269	260,292
Other So. America	199,087	47,372	1,460,594	393,140
British East Indies	26,417,669	7,591,307	313,067,034	83,678,878
Dutch East Indies	10,265,080	2,980,672	72,098,635	18,289,236
Other countries	865,490	238,069	8,587,900	2,018,809
Totals	44,634,798	$13,008,840	482,934,586	$130,333,026
Balata	84,039	41,894	786,676	464,928
Jelutong (Pontianak)	1,020,630	90,812	7,615,299	630,285
Gutta percha	135,146	24,303	1,322,731	242,860
Rubber scrap	877,698	114,557	12,275,446	879,930
Totals, unmanufactured	46,752,311	$13,280,406	504,934,738	$132,551,029
Chicle ....*dutiable*	139,026	72,928	5,817,836	2,870,746
MANUFACTURED—*dutiable*				
Rubber belting	19,082	13,702	284,585	221,079
Other manufactures of, and substitutes for rubber	.....	113,779	.....	553,636

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	224,406	$23,672	3,195,276	$326,187
Scrap and old	1,212,428	45,763	9,001,412	392,712
Footwear				
Boots ....*pairs*	47,797	88,531	184,885	470,219
Shoes ....*pairs*	126,488	109,671	398,784	348,956
Canvas shoes with rubber soles ....*pairs*	309,296	233,339	2,753,243	2,072,942
Druggists' rubber sundries	55,300	55,171	483,021	467,607
Hard rubber goods				
Battery jars and accessories	13,468	7,014	271,354	89,475
Other electrical supplies	36,318	7,946	261,200	80,554
Other hard rubber goods	20,835	27,982	323,773	257,942
Tires				
Pneumatic casings				
For automobiles	98,290	1,097,660	992,626	10,825,801
Others	5,698	18,150	57,492	215,458
Pneumatic tubes				
For automobiles	99,569	168,057	725,319	1,207,505
Others	3,797	3,770	38,651	36,415
Solid tires				
For automobiles and motor trucks	6,784	167,797	56,158	1,349,175
Others	61,104	15,265	552,399	133,977
All other tires	.....	.....	.....	.....
Tire repair materials	68,864	32,635	479,182	202,377
Belting	255,159	149,217	2,004,664	1,093,852
Hose	423,501	173,398	2,707,058	1,050,140
Packing	128,970	60,303	839,049	392,545
Soles and heels	197,773	62,592	1,159,638	405,331
Thread	62,117	68,679	623,787	637,310
Other rubber manufactures	494,841	277,785	3,474,251	1,917,648
Totals, manufactured	.....	$2,894,397	.....	$23,974,128

Exports of Foreign Merchandise

UNMANUFACTURED				
India rubber	808,221	$233,766	12,778,936	$3,904,301
Balata	4,602	3,440	121,617	58,377
Gutta percha, rubber substitutes and scrap	.....	.....	2,175	435
Totals, unmanufactured	812,823	$237,206	12,902,728	$3,963,113
MANUFACTURED				
Gutta percha and india rubber	590	1,714	3,578	4,991
Totals, manufactured	.....	$1,714	.....	$4,991

[1]Details of exports of domestic merchandise by countries during July, 1923, appeared on pages 66-68 of our October, 1923, issue.

Imports of Crude Rubber Into the United States by Customs Districts

	October, 1922		October, 1923	
	Pounds	Value	Pounds	Value
Massachusetts	1,422,305	$179,836	1,313,939	$357,443
New York	70,894,781	9,736,792	37,557,467	9,862,554
Maryland	448,000	66,756	.....	.....
Los Angeles	1,063,157	141,020	49,280	13,360
San Francisco	463,590	61,307	363,726	90,301
Washington	.....	.....	133,000	29,925
Oregon	23,350	3,390	56,000	16,244
Totals	74,315,183	$10,189,101	39,473,412	$10,375,347

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
EUROPE													
Austria	.....	.....	.....	.....	2,604	$3,906	1,320	$701	8,688	$12,598	.....	.....	.....
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	$3,548	$5,025	$27	.....	192	586	3,168	2,099	.....	.....	.....	.....	$185
Bulgaria	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	261	268	695	.....	120	308	29,170	23,504	1,308	1,839	$219	$6,044	48
Finland	1,035	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,132	88
France	2,443	400	1,997	$1,368	.....	.....	5,472	4,888	.....	.....	.....	33,268	.....
Germany	.....	.....	.....	.....	.....	.....	3,158	3,747	.....	.....	41	.....	.....
Greece	385	.....	.....	.....	.....	.....	480	466	.....	.....	.....	56	181
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	.....	.....	804	2,154	.....	.....	.....	.....	.....
Italy	2,217	86	.....	2,376	60	191	1,001	749	.....	.....	44	12,135	2,529
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	.....	8,630	.....	.....	.....	.....	.....	.....	.....	.....	165	772	1,022
Norway	1,682	276	.....	.....	650	1,574	4,701	4,152	.....	.....	109	445	302
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	36	.....	.....	.....	.....	.....	.....	.....	.....	283	634	134
Rumania	.....	.....	.....	.....	.....	.....	2,256	1,539	18,356	22,834	.....	.....	.....
Russia in Europe	.....	.....	.....	.....	12	32	60	66	.....	.....	.....	.....	.....
Spain	466	1,019	151	.....	1	4	582	445	.....	.....	22	11,051	342
Sweden	785	2,798	41	1,105	573	1,608	501	1,804	.....	.....	1,652	12,784	414
Switzerland	.....	.....	.....	.....	.....	.....	37,089	24,508	1,494	2,852	26	.....	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	469	296	.....	.....	.....	.....	.....
England	6,683	15,946	4,408	20,912	21,843	41,779	4,957	2,618	797	893	37	4,842	15,688
Scotland	3,661	238	.....	.....	5,215	7,017	647	340	.....	.....	.....	13,859	1,280
Ireland	.....	.....	.....	.....	.....	.....	280	95	.....	.....	.....	.....	.....
TOTALS, EUROPE	$23,166	$34,729	$7,319	$25,761	31,270	$57,005	96,115	$74,171	30,643	$41,016	$2,598	$97,022	$22,213
NORTH AMERICA													
Canada—Maritime Provinces	$125	$9	$16	.....	2,025	$6,779	232	$622	.....	.....	$91	.....	.....
Quebec and Ontario	6,747	5,890	4,679	$1,430	186	585	2,013	3,287	252	$358	3,073	$23,892	$3,533
Prairie Provinces	196	662	135	.....	12	45	179	416	.....	.....	.....	77	.....
Brit. Columbia and Yukon	3,283	230	169	.....	720	2,682	200	94	37	39	.....	117	.....
British Honduras	.....	63	21	.....	.....	.....	.....	.....	112	137	.....	17	.....
Costa Rica	159	376	707	.....	.....	.....	.....	.....	.....	.....	1,150	492	.....
Guatemala	.....	59	134	.....	.....	.....	79	273	.....	.....	203	1,179	167
Honduras	101	853	367	.....	.....	.....	.....	.....	1,479	1,135	613	.....	.....
Nicaragua	193	226	253	.....	.....	.....	.....	.....	862	799	929	.....	.....
Panama	928	7,111	520	.....	.....	.....	236	246	5,312	6,109	1,039	.....	88
Salvador	235	234	55	287	.....	.....	512	435	311	248	2,838	.....	.....
Mexico	25,646	16,120	12,402	.....	47	243	339	302	8,270	8,167	11,178	2,656	2,387
Miquelon and St. Pierre Islands	.....	.....	.....	.....	168	500	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador	699	1,029	286	.....	1,758	5,388	7,089	4,549	28	25	1,347	50	.....
Bermuda	29	716	21	.....	60	196	31	75	585	488	71	116	.....
Barbados	.....	8	.....	.....	.....	.....	.....	.....	240	229	.....	.....	319
Jamaica	37	661	1,106	.....	.....	.....	.....	.....	2,669	2,566	804	121	394
Trinidad and Tobago	372	71	.....	.....	.....	.....	.....	.....	502	316	.....	72	287
Other British West Indies	.....	339	.....	.....	.....	.....	.....	.....	351	452	35	.....	.....
Cuba	2,318	16,267	10,981	.....	.....	.....	1,214	758	30,754	21,280	3,607	6,599	8,190
Dominican Republic	426	2,189	1,311	.....	.....	.....	48	58	6,123	5,280	49	186	511
Dutch West Indies	.....	750	25	.....	.....	.....	72	67	8,242	6,039	.....	55	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	72	65	.....	245	.....
Haiti	54	99	549	.....	.....	.....	288	208	1,694	1,224	150	.....	178
Virgin Islands of United States	.....	524	.....	.....	.....	.....	.....	.....	256	265	269	.....	.....
TOTALS, NORTH AMERICA	$41,548	$54,486	$33,737	$1,717	4,976	$16,418	12,532	$11,390	68,461	$55,221	$27,346	$35,974	$16,054
SOUTH AMERICA													
Argentina	$7,262	$10,519	$1,121	.....	1,332	$4,958	.....	.....	11,841	$8,325	$2,252	$2,231	$20,492
Bolivia	1,074	379	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	.....
Brazil	17,172	2,067	1,233	.....	24	104	.....	.....	.....	.....	.....	.....	2,061
Chile	31,673	1,220	1,864	.....	416	1,615	252	$176	354	264	81	4,278	92
Colombia	333	967	832	.....	.....	.....	240	160	1,668	1,366	2,955	948	76
Ecuador	30	490	907	.....	.....	.....	.....	.....	2,485	1,185	.....	64	.....
British Guiana	.....	.....	.....	.....	.....	.....	.....	.....	600	406	.....	.....	133
Dutch Guiana	.....	.....	.....	.....	.....	.....	.....	.....	408	417	.....	.....	.....
Paraguay	.....	145	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	3,638	4,673	237	.....	138	523	60	59	.....	.....	117	390	111
Uruguay	.....	359	342	.....	35	225	240	223	18,104	13,039	961	382	.....
Venezuela	46	1,099	248	.....	.....	.....	168	134	.....	.....	3,992	1,177	.....
TOTALS, SOUTH AMERICA	$61,228	$21,918	$6,784	.....	1,945	$7,425	960	$752	35,460	$25,002	$10,358	$9,481	$22,965
ASIA													
Aden	.....	$13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$5,140	746	$180	.....	.....	.....	120	$87	1,427	$1,105	$118	$7,756	$77
Ceylon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71
Straits Settlements	238	.....	.....	.....	.....	.....	.....	.....	2,830	1,956	.....	.....	455
China	264	4,632	600	.....	.....	.....	5,922	4,833	.....	.....	15	2,359	2,033
Chosen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Java and Madura	7,765	880	974	.....	.....	.....	.....	.....	90	76	.....	106	5,525
Other Dutch East Indies	148	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	.....	98	.....	.....	.....	552	764	48	44	.....	.....	.....
Japan	2,509	4,102	4,782	$3,741	682	$1,938	1,774	1,644	.....	.....	.....	.....	765
Palestine and Syria	.....	.....	.....	.....	.....	.....	624	603	.....	.....	.....	.....	726
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands	4,314	2,595	2,347	.....	.....	.....	.....	.....	67,901	53,329	5,643	1,113	1,454
Russia in Asia	.....	.....	.....	.....	4	28	2	8	.....	.....	.....	.....	.....
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Turkey in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$20,378	$12,968	$8,981	$3,741	686	$1,966	8,994	$7,939	72,296	$56,510	$5,776	$11,334	$11,106

United States by Countries During September, 1923

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	Other Rubber Manufactures Value
.....	15	$312	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	10	220	.....	.....	.....	10	$30	.....	$56	.....	.....	.....	.....	.....
.....	201	3,964	$60	.....	.....	152	399	.....	840	$74	.....	.....	.....	$2,564
.....	83	1,110	.....	$129	.....	142	253	.....	.....	.....	.....	.....	.....	.....
.....	2	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	4,844	54,821	798	2,755	$45	4,867	6,422	$267	1,940	509	.....	.....	.....	3,955
.....	441	6,470	.....	270	.....	591	1,073	.....	.....	.....	.....	.....	.....	60
.....	.....	.....	.....	.....	.....	.....	.....	.....	4,934	272	.....	.....	$1,499	4,801
.....	34	489	.....	.....	.....	10	14	.....	.....	.....	.....	.....	.....	527
.....	315	4,102	.....	1,659	.....	117	280	.....	110	.....	.....	.....	.....	.....
.....	65	1,131	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	40	440	.....	.....	.....	189	284	.....	.....	.....	.....	.....	.....	.....
.....	1,132	11,372	1,070	.....	.....	238	453	.....	25	311	.....	.....	.....	82
.....	120	1,122	.....	.....	.....	106	169	.....	.....	.....	.....	.....	.....	.....
$27	1,597	19,937	1,273	216	217	1,749	3,496	225	399	.....	.....	.....	1,270	3,414
.....	369	5,951	.....	1,380	.....	286	643	114	63	.....	.....	$164	.....	369
.....	35	356	.....	62	.....	60	109	.....	.....	.....	.....	.....	.....	.....
.....	75	1,202	222	.....	.....	165	264	42	.....	.....	.....	.....	.....	708
.....	200	3,526	.....	.....	.....	248	577	.....	.....	.....	.....	.....	.....	.....
.....	50	1,435	.....	10,832	.....	250	740	.....	.....	125	.....	20	.....	.....
.....	2,975	52,446	132	14,742	.....	3,232	6,513	.....	1,829	751	.....	.....	.....	665
350	2,736	33,638	1,613	2,852	.....	2,686	3,921	255	881	390	.....	.....	.....	3,630
.....	71	3,894	.....	.....	.....	175	598	21	.....	.....	.....	.....	.....	335
.....	65	666	.....	.....	.....	40	68	.....	8	.....	.....	.....	.....	17
2,167	6,550	65,233	271	81,367	10	2,371	3,844	93	5,431	16,828	.....	.....	4,240	56,223
.....	100	1,079	.....	1,708	.....	28	39	.....	.....	400	.....	.....	.....	897
.....	190	2,114	.....	.....	.....	198	291	.....	.....	.....	.....	.....	.....	.....
$2,544	22,315	$277,080	$5,439	$117,972	$272	17,910	$30,480	$1,017	$16,516	$19,660	.....	$184	$7,009	$78,247
$178	23	$460	.....	.....	.....	4	$6	$5	$12	$146	.....	.....	.....	$1,202
946	555	12,257	$36	$3,349	$14	991	2,387	208	4,456	10,774	$531	$2,411	$13,757	75,649
.....	2,096	17,375	.....	278	.....	2,229	3,758	.....	702	645	.....	13	347	6,933
337	103	1,747	4	740	26	102	199	.....	12	711	.....	.....	315	3,163
62	12	79	.....	30	.....	2	10	.....	.....	70	.....	1	.....	.....
219	56	776	.....	.....	55	52	85	.....	.....	.....	.....	.....	56	239
13	66	1,149	140	.....	.....	94	239	.....	.....	7	.....	.....	.....	175
1,776	46	840	.....	769	.....	41	57	10	.....	206	.....	.....	.....	566
.....	40	489	.....	.....	.....	49	74	.....	114	11	52	.....	80	113
421	696	6,682	381	521	.....	120	244	104	14	518	.....	.....	418	3,268
.....	187	3,762	12	288	4	508	1,117	5	.....	.....	.....	.....	.....	.....
3,820	6,588	68,874	238	3,703	316	4,533	7,581	297	2,320	2,743	31	276	4,116	11,475
164	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	24
388	130	1,808	.....	.....	106	125	226	.....	6	147	.....	.....	454	558
285	.....	.....	.....	.....	.....	.....	.....	.....	.....	55	.....	15	.....	229
.....	20	115	.....	179	.....	.....	.....	.....	.....	.....	.....	.....	.....	137
20	347	5,198	.....	305	.....	187	466	.....	.....	118	.....	66	.....	1,306
.....	125	1,581	16	.....	.....	130	261	.....	27	141	.....	.....	.....	686
.....	181	1,638	.....	.....	18	277	375	.....	15	.....	.....	29	.....	235
11,617	9,806	95,202	867	12,874	401	5,184	8,271	463	603	5,917	.....	.....	456	12,702
166	1,878	22,001	448	419	121	2,571	4,656	58	22	304	.....	.....	.....	1,979
509	36	427	.....	.....	.....	72	137	.....	.....	.....	.....	.....	.....	192
.....	58	529	.....	.....	557	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	179	2,401	73	.....	.....	211	358	42	40	.....	.....	.....	187	128
12	53	640	22	.....	.....	63	113	.....	.....	.....	.....	.....	.....	.....
$20,933	23,281	$246,030	$2,237	$23,455	$1,618	17,545	$30,620	$1,192	$8,343	$22,519	$614	$2,811	$20,186	$120,959
$867	14,278	$155,174	.....	$1,374	.....	8,576	$13,803	.....	$1,768	$2,522	.....	$2,073	$254	$7,239
.....	30	505	.....	.....	.....	61	168	.....	.....	.....	.....	.....	.....	401
142	861	11,366	$95	509	.....	785	1,163	.....	93	563	$85	1	.....	1,307
396	1,148	13,646	.....	114	.....	533	1,174	.....	.....	.....	.....	398	259	1,932
531	400	5,969	58	.....	$904	482	720	$4	163	276	.....	2	440	907
.....	74	865	.....	.....	.....	48	73	.....	.....	771	.....	.....	.....	919
.....	22	206	.....	.....	.....	12	17	.....	59	.....	.....	.....	.....	168
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	63	108
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,228	999	13,371	.....	822	.....	1,052	1,875	.....	62	85	.....	.....	.....	727
1,055	1,401	17,369	.....	.....	.....	1,644	2,815	.....	183	122	.....	.....	430	1,288
.....	850	9,337	86	407	305	1,268	2,113	.....	41	415	.....	115	.....	397
$4,219	20,063	$227,808	$239	$3,226	$1,209	14,461	$23,921	$4	$2,369	$4,755	$85	$2,589	$1,446	$15,393
.....	308	$2,811	.....	.....	.....	103	$177	.....	.....	.....	.....	.....	.....	.....
.....	1,197	10,088	$129	$5,976	$1,523	1,295	2,135	$17	$332	$549	$217	$90	.....	$1,625
.....	.....	.....	.....	741	.....	.....	.....	.....	400	.....	.....	.....	.....	.....
.....	42	571	.....	713	.....	36	69	.....	.....	.....	.....	.....	.....	31
.....	1,330	11,297	1,566	1,001	77	1,929	2,237	174	423	3,122	123	.....	.....	2,666
.....	438	5,036	.....	.....	.....	.....	.....	.....	142	.....	.....	.....	.....	2,432
.....	840	11,025	.....	1,380	3,735	735	1,450	.....	.....	259	.....	.....	.....	370
.....	54	844	.....	170	.....	.....	.....	.....	.....	.....	.....	.....	.....	431
.....	142	1,416	.....	.....	.....	150	204	.....	51	.....	.....	.....	.....	.....
.....	116	1,655	.....	110	.....	117	262	.....	.....	.....	83	.....	$40	945
$40	1,514	15,155	3,232	1,071	.....	931	1,555	46	11	1,326	.....	15	113	5,323
.....	630	6,610	.....	.....	.....	524	791	.....	202	.....	.....	.....	.....	446
.....	27	269	.....	287	.....	19	34	.....	.....	.....	.....	.....	.....	.....
128	1,945	25,831	1,237	6,715	4,659	1,622	2,991	196	243	420	.....	.....	125	8,618
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	45	468	.....	.....	.....	40	50	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	215	.....	.....	.....	.....	.....	.....	.....	.....	.....
$168	8,628	$93,076	$6,158	$18,164	$10,209	7,501	$11,955	$433	$1,804	$5,676	$423	$105	$278	$22,887

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
OCEANIA													
Australia	$835	$1,621	$113	.....	264	$752	2,163	$1,688	8,008	$6,062	.....	$26,833	$1,666
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	921	955	.....	.....	.....
French Oceania	13	128	80	.....	.....	.....	.....	.....	724	807	$75	.....	28
New Zealand	2,024	2,632	1,301	.....	294	726	48	110	.....	.....	150	2,489	4,710
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	130	141	.....	.....	.....
TOTALS, OCEANIA	$2,872	$4,381	$1,494	.....	558	$1,478	2,211	$1,798	9,783	$7,965	$225	$29,322	$6,404
AFRICA													
Belgian Kongo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British West Africa	$94	.....	.....	.....	.....	.....	.....	.....	120	$178	.....	.....	.....
British South Africa	21,663	$14,965	$4,912	.....	548	$944	234	$368	1,056	1,259	$1,214	$4,754	$1,876
British East Africa	27	.....	.....	.....	.....	.....	.....	.....	408	371	.....	.....	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	.....	.....
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	1,638	.....	770	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39
TOTALS, AFRICA	$23,422	$14,965	$5,682	.....	548	$944	234	$368	1,584	$1,808	$1,256	$4,754	$1,915
GRAND TOTALS	$172,614	$143,447	$63,997	$31,219	39,983	$85,236	121,046	$96,418	218,227	$187,522	$47,559	$187,887	$80,657

United Kingdom Rubber Statistics

Imports

	September, 1923 Pounds	September, 1923 Value	Nine Months Ended September, 1923 Pounds	Nine Months Ended September, 1923 Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	11,428,100	£717,118	53,766,000	£3,270,855
Federated Malay States	7,303,800	446,756	27,045,400	1,662,096
British India	478,900	29,647	5,501,300	342,020
Ceylon and dependencies	2,905,200	178,292	17,397,100	1,062,133
Other Dutch Possessions in Indian Seas	511,500	33,410	1,658,300	107,206
Dutch East India (except other Dutch Possessions in Indian Seas)	1,977,000	120,783	9,085,000	546,939
Other countries in East Indies and Pacific not elsewhere specified	235,900	15,116	1,057,700	69,634
Brazil	1,300,800	73,386	5,417,300	310,035
Peru	66,200	2,800	139,100	6,239
South and Central America (except Brazil and Peru)	.....	.....	273,900	14,727
West Africa				
French West Africa	14,400	776	779,600	38,319
Gold Coast	19,500	956	118,500	5,552
Other parts of West Africa	45,800	1,885	403,200	14,032
East Africa, including Madagascar	35,600	1,866	392,300	21,630
Other countries	325,300	18,271	992,700	56,525
Totals	26,647,900	£1,641,062	124,027,400	£7,527,942
Waste and reclaimed rubber	131,800	1,341	1,566,600	22,042
Gutta percha and balata	716,500	115,520	6,604,000	898,870
Rubber substitutes	1,100	26	37,900	714
Totals, unmanufactured	27,499,300	£1,757,949	132,235,900	£8,449,568
MANUFACTURED				
Boots and shoes...*doz. pairs*	6,608	£24,674	134,332	£233,596
Tires and tubes				
Pneumatic				
Outer covers	.....	132,337	.....	2,431,302
Inner tubes	.....	18,204	.....	288,285
Solid tires	.....	29,741	.....	184,963
Other rubber manufactures	.....	64,792	.....	751,000
Totals, manufactured	.....	£269,748	.....	£3,889,146

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	341,500	£5,346	6,408,300	£72,560
Rubber substitutes	202,800	4,607	1,134,800	24,576
Totals, unmanufactured	544,300	£9,953	7,543,100	£97,136
MANUFACTURED				
Boots and shoes...*doz. pairs*	24,542	£43,152	157,869	£253,731
Tires and tubes				
Pneumatic				
Outer covers	.....	144,391	.....	1,162,955
Inner tubes	.....	22,231	.....	212,364
Solid tires	.....	29,627	.....	228,441
Other rubber manufactures	.....	211,078	.....	2,077,313
Totals, manufactured	.....	£450,479	.....	£3,934,804

Exports—Colonial and Foreign

	September, 1923 Pounds	September, 1923 Value	Nine Months Ended September, 1923 Pounds	Nine Months Ended September, 1923 Value
UNMANUFACTURED				
Crude rubber				
To Russia	2,276,200	£166,012	4,104,200	£277,288
Sweden, Norway and Denmark	175,100	11,475	1,220,400	76,944
Germany	1,279,600	84,481	9,984,800	614,746
Belgium	340,400	22,076	2,584,800	168,455
France	2,110,600	134,800	24,851,200	1,613,018
Spain	90,200	5,716	348,200	22,519
Italy	811,800	51,824	6,807,800	431,013
Austria	300	18	400	22
Hungary	.....	.....	45,100	3,421
Other European countries	113,800	7,772	1,182,900	74,072
United States	674,600	45,992	63,388,200	4,344,735
Canada	114,200	7,262	3,967,300	262,918
Other countries	143,400	9,541	727,400	47,273
Totals	8,130,200	£546,969	119,212,700	£7,936,424
Waste and reclaimed rubber	.....	.....	173,200	1,823
Gutta percha and balata	126,800	14,970	728,900	102,405
Rubber substitutes	11,100	333	13,100	353
Totals, unmanufactured	8,268,100	£562,272	120,127,900	£8,041,005
MANUFACTURED				
Boots and shoes...*doz. pairs*	64	£244	4,378	£7,521
Tires and tubes				
Pneumatic				
Outer covers	.....	21,267	.....	114,050
Inner tubes	.....	2,504	.....	17,244
Solid tires	.....	1,528	.....	10,228
Other rubber manufactures	.....	5,366	.....	33,248
Totals, manufactured	.....	£30,909	.....	£182,291

DUTCH EAST INDIES INCREASE RUBBER EXPORTS

The Dutch East Indies exported to the United States during the twelve months ended December 31, 1922, a total of 92,124,220 pounds of crude rubber, valued at $14,647,103, an amount almost double that exported to this country for the twelve months of the year preceding, which was estimated at 53,012,222 pounds and valued at $10,497,109. For the first four months of 1923 such exports, continuing to increase, have already totaled 40,557,438 pounds, valued at $9,270,639, as compared with 30,571,678 pounds, valued at $5,072,940, for the corresponding period of the year preceding.

During January of the present year the United States imported from the Dutch East Indies 18,088,976 pounds of crude rubber, valued at $3,354,044, an amount more than three times that for January, 1922, or 5,634,533 pounds, while the value is almost four times that of the corresponding 1922 figure, or $899,304.

United States by Countries During September, 1923—*Continued*

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	Other Rubber Manufactures Value
.....	3,471	$48,014	.....	$22,187	.....	2,028	$3,756	.....	$2,881	$3,647	.....	.....	$1,139	$5,292
.....	9	79	.....	.....	.....	12	17	.....	.....	.....	$117	.....	31	.....
.....	32	343	.....	152	$106	22	37	.....	41	.....	52	.....	.....	.....
.....	4,969	61,552	.....	21,850	105	1,536	4,056	$36	569	1,467	30	.....	.....	3,379
.....	15	183	$19	.....	.....	30	54	.....	.....	.....	.....	.....	36	.....
.....	8,496	$110,171	$19	$44,189	$211	3,628	$7,920	$36	$3,491	$5,114	$199	.....	$1,206	$8,671
.....	6	$116	.....	.....	.....	38	$100	.....	.....	.....	.....	.....	.....	.....
.....	735	11,142	.....	.....	.....	502	1,071	$14	.....	$10	.....	.....	.....	$353
$4,642	1,489	17,076	.....	$167	$45	2,462	3,911	15	$818	188	.....	.....	.....	10,203
501	385	4,764	.....	94	.....	272	711	49	213	.....	.....	.....	.....	26
.....	520	5,969	.....	1,137	.....	214	304	.....	193	.....	.....	.....	.....	49
.....	424	4,281	.....	70	.....	341	1,594	.....	31	.....	.....	.....	.....	633
.....	.....	.....	.....	511	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	230	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	99
.....	20	382	.....	.....	.....	20	47	.....	.....	.....	.....	.....	.....	.....
$5,143	3,579	$43,730	.....	$1,979	$45	3,849	$7,738	$78	$1,485	$198	.....	.....	.....	$11,363
$33,007	86,362	$997,895	$14,092	$208,985	$13,564	64,894	$112,634	$2,760	$34,008	$57,922	$1,321	$5,689	$30,125	$257,520

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	August, 1923 Pounds	August, 1923 Value	Five Months Ended August, 1923 Pounds	Five Months Ended August, 1923 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	81,434	$22,801	2,488,860	$798,079
United States	1,310,648	366,609	7,931,589	2,269,485
Belgium	.....	.....	.....	.....
Brazil	.....	.....	.....	.....
British East Indies:				
Ceylon	.....	.....	.....	.....
Straits Settlements	328,000	78,034	2,625,097	802,938
Dutch East Indies	.....	.....	112,224	30,851
France	2,320	620	2,320	620
Other countries	.....	.....	116,052	27,536
Totals	1,722,402	$468,064	13,276,142	$3,929,509
Rubber recovered	276,765	22,289	1,290,553	116,111
Rubber, powdered and rubber or gutta percha scrap	304,475	8,294	2,289,992	84,490
Balata	1,489	1,256	4,209	3,546
Rubber substitutes	19,196	3,166	326,360	42,038
Totals, unmanufactured.	2,324,327	$503,069	17,187,256	$4,175,694
PARTLY MANUFACTURED				
Hard rubber sheets and rods	5,327	3,330	31,506	16,669
Hard rubber tubes	.....	.....	.....	9,410
Rubber thread, not covered	2,550	2,921	35,446	40,615
Totals, partly manufactured	7,877	$6,251	66,952	$66,694
MANUFACTURED				
Belting	.....	$19,058	.....	$73,090
Hose	.....	14,341	.....	63,027
Packing	.....	4,385	.....	21,834
Boots and shoes—*pairs*	9,841	19,393	46,436	83,643
Clothing, including waterproofed	.....	13,062	.....	91,606
Gloves	.....	1,161	.....	6,341
Hot water bottles	.....	509	.....	8,198
Tires, solid—*number*	143	6,844	5,114	51,387
Tires, pneumatic—*number*	8,595	88,601	53,052	540,050
Inner tubes—*number*	3,483	6,966	18,460	33,323
Elastic round or flat	.....	23,799	.....	138,511
Mats and matting	.....	692	.....	9,968
Cement	.....	4,078	.....	22,782
Other rubber manufactures	.....	108,199	.....	687,102
Totals, manufactured	.....	$311,088	.....	$1,830,862
Totals, rubber imports	.....	$820,408	.....	$6,073,250

Exports of Domestic and Foreign Rubber Goods

	August, 1923 Produce of Canada Value	August, 1923 Re-exports of Foreign Goods Value	Five Months Ended August, 1923 Produce of Canada Value	Five Months Ended August, 1923 Re-exports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$2,845	.....	$25,471	$28,542
Totals, unmanufactured.	$2,845	.....	$25,471	$28,542
MANUFACTURED				
Belting	$9,984	.....	$82,786	.....
Canvas shoes with rubber soles	122,250	.....	532,973	.....
Boots and shoes	123,522	.....	225,751	.....
Clothing, including waterproofed	2,115	.....	9,376	.....
Hose	9,396	.....	44,654	.....
Tires, casings	358,425	.....	2,657,799	.....
Inner tubes	40,368	.....	274,988	.....
Pneumatic	.....	.....	.....	.....
Solid	12,839	.....	45,341	.....
Vehicle	.....	390	.....	3,153
Other rubber manufactures	20,647	4,817	92,743	19,523
Totals, manufactured	$699,546	$5,207	$3,966,411	$22,676
Totals, rubber exports	$702,391	$5,207	$3,991,882	$51,218

RETAIL PRICE LISTS ABOLISHED

The action of leading tire manufacturers in abolishing retail price lists was evidently approved by those attending the meeting of the Tire Manufacturers' Division of the Rubber Association of America, held in Chicago on November 1. The abandonment of the consumers' list necessitated a change in the method of figuring adjustments, and a uniform practice in this respect was proposed by the Service Managers' Committee, the suggestions being that:

Adjustments be based on a figure consisting of dealer's price plus a certain percentage (to be fixed by each company individually) representing the probable cost to the consumer.

To avoid the constant use of a printed consumers' or adjustment list, it is suggested that various proportions of the percentage thus secured be expressed by percentages of dealers' prices and that these only be used in making adjustments. For example: Price to dealer, $40, plus, say, 42.9 per cent to obtain the equivalent of a 30 per cent discount from what used to be the consumers' list equals $57.15, representing price consumer probably pays.

Assuming the tire has given only half service, entitling the consumer to another for half the price of the original, or $23.58, this amount is 71.5 per cent of $40, the dealer price. Consequently, in the absence of consumers' or adjustment list, the purchaser may be asked to pay 71.5 per cent of dealer's price instead of one-half or 50 per cent of what was formerly the consumer list price. In other words, 71.5 per cent of the dealer's price is the same amount as 50 per cent of the former consumer's list.

The recent modifications of spring dating were also discussed, but no action was taken. There were indications, however, that practically all manufacturers will abolish the 5 per cent cash discount and substitute a 2 per cent cash discount.

INDIA RUBBER WORLD
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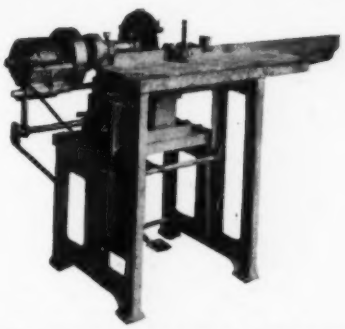

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Our Publicity Page

The India Rubber World as Its Readers See It

An exceptionally high percentage of subscription renewals, and a representative circulation in 120 countries in addition to the United States and Canada, ought to be praise and assurance enough for any publisher. And so it is. But it is also very gratifying to have subscriptions accompanied by letters of commendation indicating that readers everywhere appreciate our sincere efforts to serve them by publishing the most comprehensive, timely and authoritative record of the rubber and allied trades possible. It is with pardonable pride, therefore, that we quote from a few recent letters from American subscribers.

Rubber Companies Would Not Do Without It

A. J. Starhow, general manager, Northwestern Rubber Co., Kent, Washington, accompanies his subscription by the following:

> May we not say that we find your publication most interesting and instructive? We could not do without it.

With a renewal from the new owners of the Denver Rubber Co., Denver, Colorado, comes a letter from the former manager in which he says:

> I have informed them that it will be simply impossible for them to conduct the business satisfactorily without having your splendid paper.

R. H. Geild, president, Keystone Rubber Co., Chicago, Illinois, sends a subscription and writes:

> The writer, for more than thirty-five years with the W. H. Salisbury Co., and the past year with the Buffalo Weaving & Belting Co., of this city, is now associated with the Keystone Rubber Co., a new corporation, and misses THE INDIA RUBBER WORLD.

Allied Interests Hold the Same Opinion

An official of The Leatherwear Co., New York, N. Y., says regarding his renewal subscription:

> I find that it is utterly impossible to get along without your trade paper.

That we are not our only boosters is shown by the following from the general manager of the Thac Industrial Products Corporation, Trenton, New Jersey:

> Mr. Fleming of the Tidewater Chemical Co., New York, N. Y., says that your publication is the "bible" of the rubber industry and we are going to see whether or not he speaks the truth.

M. D. Logan, Los Angeles, California, an inventor who has the crude rubber market under observation, writes:

> The only reliable market information I am able to get is within the pages of THE INDIA RUBBER WORLD.

It Has the Confidence of Its Readers

Such letters as these indicate how THE INDIA RUBBER WORLD is generally regarded, and that when an authority speaks the trade listens. THE INDIA RUBBER WORLD enjoys to a marked degree the confidence of its readers, due to the strength of its editorship. Because its news is accurate and up to the minute; because its reflection of industrial developments and conditions is comprehensive, authentic and unbiased; because its opinions and forecasts are sound and well considered; and because it is in the fullest sense an authority in the field it serves, THE INDIA RUBBER WORLD holds the attention and respect of its many readers year after year.

Club Subscriptions at Special Reduced Rates

THE INDIA RUBBER WORLD is subscribed to by practically every rubber manufacturer in America and by most of the leaders abroad. In most cases it is also routed through the plant for the attention of the various departments. Many companies, however, provide individual subscriptions for their various officials and executives in charge of departments and branches. For such club subscriptions special reduced rates will be quoted on application. Some large companies have over 100 copies monthly, so as to reach the entire organization.

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